The Cult of the Serpent

An Interdisciplinary Survey of its Manifestations and Origins



BALAJI MUNDKUR

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Painted terracotta vase, probably the image of a goddess of fertility or death, from a tumulus of the Neolithic Period, Kamnik, Albania. The protuberant bifid tongue, whose lobes clasp diminutive breasts, and the countenance clearly reflect her ophidian aspects. [Courtesy of The Albanian Mission to the United Nations]

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Preface

The species of animals that loom in human thought are legion. Among those which receive conspicuously selective attention as cult objects, none in my experience can match the serpent with respect to the volume of information available from the most varied sources. To highlight on a worldwide scale the reasons for man's extraordinary sensitivity to this animal, I have had to delve into specialized branches of knowledge too diverse to be within the formal educational preparation of any single individual. Fortunately, this knowledge is not so esoteric as to inhibit the curiosity of one with a grounding in the biological sciences and serious interests in cultural anthropology and religious art. In distilling the essence of so wide-ranging a body of literature as I have tried to represent in these pages, an important ingredient is bound to be diluted or lost: namely, the "vital spark" that investigators detect amidst the details of their original sources of information but cannot retransmit as persuasively through a perforce sketchy, multidisciplinary approach. This is especially true of religious customs and the art they inspired in antiquity—for how can one effectively convey literary gems,

complex graphic symbolism, and the subtle fervor of culturally conditioned beliefs when no more than a small fraction of this material can be accommodated here? The need for brevity forces me to include only the most essential illustrations and forsake the eloquence of a great many others. I hope that my findings will impel research workers to probe their areas of specialization for cult-related significances that are liable to be overlooked unless sought for from the broad perspective espoused in this book. All this aside, and though I have striven for accuracy, my presentation cannot conceal my real shortcomings. None of these, I hope, will seriously injure the main argument.

My viewpoint is that of a mechanistically inclined biologist, though for many years my time and interest have been almost fully absorbed by the literature in the humanities and social sciences that forms the bulk of this work and significantly influences its conclusions. My thesis is uncomplicated, yet the arguments have not heretofore been marshaled by anyone through an eclectic, wide-ranging analysis: Sensitivity to the serpent's form and sinuous motion was fixed in man's psyche during anthropogenesis and is reflected in extraordinary ways in his animal behavior, which is inseparable from his social behavior and religious beliefs involving the serpent. These overt expressions are rooted in the complex long-term physiological effects of fear, which subsumes anxiety and stress—including their psychological repercussions. While I question the credibility of current psychoanalytical conjectures on ophidian symbolism and see the redundancy of offering similar alternatives, I cannot avoid the conclusion that the serpent was one of the earliest of animal species to have elicited veneration.

Most people, especially modern urban people, will probably admit that they abhor the serpent irrationally. Psychoanalytically inclined anthropologists and others dealing with symbols, however, have invented or entertained far-fetched hypotheses or theories about animals that have left an impress on primitive cultures and human thought in general. The serpent has not been exempted from such speculation. Because it is usually lumped with other species in more or less generalized explanations of cultural attitudes towards animals, neither the biological bases of the human sensitivity that prompts revulsion towards the serpent nor the latter's unique place in human social history have been sufficiently appreciated.

This book, therefore, is addressed primarily to the cultural anthropologist and student of primitive religion, but, because of the nature of my theme, the core of which is the science of human behavior, I have also tried to present my viewpoint so as to reach others with professional or serious extramural interest in one or another of the several disciplines I take into account.

Organizing the pertinent information succinctly—striking a balance between what some might think are too many examples and others too few and between specialized data and easily assimilable narrative—has not been easy. Categorizing on the bases of geography, chronology, and ethnic groups at first seemed attractive, but the illogic and artificiality of this soon became apparent to me as it detracted from the cross-cultural emphasis my theme merits. I have, therefore, felt no inhibition about shifting freely between quite unrelated cultures—primitive and civilized, ancient and contemporary—and, in the biological arguments, between human and nonhuman primate societies in order to make the point that the cult of the serpent is one of man's very earliest. The different facets of my theme are drawn from a number of societies representative of

"distinctive world areas" in G. P. Murdock and D. R. White's Standard Cross-cultural Sample. These societies, I believe, are more than adequate for our purposes. Furthermore, information specifically relevant to my analysis was unavailable in some cases, and my salient findings would not have become more impressive merely by increasing the variety in my sample.

May I include myself in this sample, at least prefatorially, and reveal my biases? I focus, as I have said, on the complex repercussions of elementary fear of a specific object, perhaps one of a very small group united by more or less similar etiologies. As a child, in the countryside of my native India, I do not remember ever "learning," either imitatively or directly from others, to fear the reptiles that infested our neighborhood—for Hindus, brahmans especially, despite their inwardly ambivalent awe of serpents, adopt as a religious rule the attitude of "live and let live." One of my strongest, most oppressive, and embarrassing, memories was for long that of finding (when I was six or seven years old) a large serpent (certainly not a cobra) hanging by its tail from the bamboo strips supporting the thatched roof inside a small outhouse-latrine, its eyes fixed directly on me as I opened the door. I nurse the memory of this incident, though casually, even as an adult. As a college student on a biological field trip in the *ghats* of western India, I idly kicked aside a rotting tree stump only to discover in a depression beneath it a family of writhing baby cobras. Mere hatchlings, but venomous from birth, they poised themselves threateningly, only the direction of a strong sun preventing them from further action. Except in childhood, I have never harbored an irrational loathing for serpents and am perfectly at ease in handling one, but I must admit that I recoil agitatedly when I occasionally cross the path of harmless gartersnakes in the woods behind my house in rural Connecticut. Incidents like these produce no dreams lingering into my conscious state—at least not immediately. I have dreamt of serpents only erratically and infrequently, and for no apparent reason; but these dreams have always been extremely frightening. They have, in some measure, stimulated this work on ophidiophobia—a word I use in the simple, nonpsychiatric sense of the malapropism "snake fear" seen so frequently in psychological literature.

My anecdote has a bearing on one of several important facets not only of ophidiophobia, but also of other specific fears: the inscrutability of some of the factors that affect the mind, even transiently, cause dreams, and determine their imagery. If, as the statistics in my text show, modern urban people totally unexposed to experiences like mine are susceptible to the vagaries of dreams of serpents (or, less frequently, other animals), how seriously and with what superstition-laden social consequences may early man have viewed frightful dreams of his actual environmental hazards? And dreams reflect only one side of the emotional tensions that hinge upon the environment. Babylonian omen texts exemplify this with many references to serpents' falling upon sleeping persons from roofs of wattle and daub, in which they sought shelter and rodents.

My goal, therefore, should not be viewed as a narrow inquiry into the "biological causes" of ophiolatry. The cultic beliefs that have arisen from ophidiophobia not only betray the power of a unique animal over human imagination, but also lend color to the forces that in one way or another shape religious faith in general.

Certain parts of the text and a few of the illustrations have appeared in my articles published in *Ethos, Current Anthropology, East and West,* and *The Muslim*

World. I am grateful to the American Society for Psychological Anthropology, the Wenner-Gren Foundation for Anthropological Research, the Istituto per il Mediteraneo ed Estremo Oriente, and the Hartford Seminary Foundation, respectively, for releasing copyrights on these (emended) portions of my articles. I am indebted to the University of Connecticut Research Foundation for several generous grants that encouraged my studies in diverse disciplines.

Colleagues and librarians in the numerous countries I have visited have provided much useful information for this work. I will not name them individually, though I am grateful to every one. I am especially indebted to two persons: George Kubler, who has indirectly influenced my thinking in several ways, and the Associate Dean for Research Development of the Graduate School of the University of Connecticut, Hugh Clark. Without the latter's recognition of my serious extrabiological academic inclinations and intercessions on my behalf, neither the opportunity of offering formal courses in religious art in our art history department nor the opportunity of writing this book would have materialized. As with anyone who assembles diverse information in order to extract from it a collective sense, my debt is deepest to all those whose own published findings or opinions I here turn to useful account.

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CHAPTER 1

Interpreting the Fascination of Serpents

To fascinate, the Oxford English Dictionary tells us, is "to affect by witchcraft or magic; to bewitch, enchant, lay under a spell; to cast a spell over by a look." To make these meanings more vivid it adds "said especially of serpents" and of their ability "to deprive of the power of escape or resistance. . . . through the terror produced by their look or merely by their perceived presence." Emphasizing this influence, it quotes Lytton: "The fascination of the serpent on the bird held her mute and frozen." Lytton exercises poetic license, of course, but he is inaccurate only to the extent that it is man and kindred primates rather than birds, that, for biological reasons, are the more apt candidates for such transfixion.

The almost morbid curiosity which both children and adults reserve for the serpent is underscored by T. H. Gillespie, the former director of the Edinburgh Zoo. Visitors, he writes, cram the Reptile House and outnumber "at least a dozen to one" those in the adjoining, very attractive Tropical Bird House; "even

such star attractions as penguins and chimpanzees fail to outrival [the snakes]."[1] I should add that though we know the serpent behind the glass barrier to be of a nonvenomous variety, few among us respond kindly to its pattern of beautiful colors or to the remarkable agility and grace of its limbless motion. Fewer can avoid uneasiness, even loathing, at the sight of its flickering tongue, the fixed gaze of its lidless eyes, the slithering, undulating form of its body, and the violence of its feeding habits. At the core of its aura of mystery lies a surreptitious voicelessness. How terrifying a sudden encounter with one of a venomous species is likely to be in natural surroundings!

Entreaties against their silent attack in the field and in human dwellings or their potential for other forms of "malevolence," find earnest expression in apotropaisms—as amulet, talisman, incantation, votive offering or mawkish prayer—of almost every society that looks upon serpents as dangerous adversaries (fig. 1). Yet, anxiety about a possibly venomous bite is only a partial reason for man's abhorrence of this animal. In many languages, the venomous species are lumped apart from the harmless ones by the use of different collective nouns or descriptive epithets that clearly reflect an ability to distinguish between the two types. The normal human tendency, however, is to shrink away in haste, automatically and indiscriminately, from the proximity of either.

The distinction between the words "snake" and "serpent" is a dim one in popular parlance, but it involves more than a linguistic sublety. The former is the native English word and far more commonly used; the latter is considered alien and sometimes reserved for venomous or larger species. A snake is merely the zoological entity, but "serpent," as we will see, opens up vast metaphorical possibilities. The lexicographer Fowler aptly observes that "we perhaps conceive serpents as terrible and powerful and beautiful things, snakes as insidious and cold and contemptible."[2] However, many languages are devoid of these obscure nuances. For example, Spanish has only two synonyms, *culebra* and *serpiente,* each of which is as noncommittal about venom as *Schlange,* the one and only German word for the animal. In ancient Mesopotamia the Sumerian and Akkadian word *muš* was its generic denomination, but various suffixes were employed to identify different kinds of serpents—including *muš-huš,* a mythical, quadruped, hybrid monster whose artistic portrayals conceal its primarily reptilian lineage.[3] Similarly, the legendary basilisk (cockatrice), a hideous, evil creature hatched from a cock's egg incubated by a toad, is portrayed in medieval European art as a cock with a serpentine tail. Sometimes even this appendage is short and ends as the hindquarters of a dog whose tail, in turn, represents a serpent with a demoniacal face (fig. 2). However, the "poyson glare," characterized in excerpts in Middle English in the Oxford English Dictionary, resided in the *cock's* "fiery red eyes" that "fascinated" and "hurte unto the deth," true to this monster's reputation of "kyng of serpentes that with smyl and sijt sleeth beestes." Discordant situations like these prompt me to abandon the commoner but less pregnant word "snake," employ "serpent" (and the adjective "ophidian") to cover both metaphor and animal, and allow the latter to identify itself from context.

This mental separation is easy, for from time immemorial man's imagination has turned the animal into a creature of fantasy, including hybrids that caricature its real ophidian qualities. These include the bearded serpents of ancient Egyptian and Greek religion; the partly human-bodied cobras with mul-



Fig. 1 Mahāmāyurī, protectress against snakebites, a partly serpent-bodied goddess whose ferocity can cause floods, earthquakes, and other catastrophies; wall painting, sixteenth-century A.D., Tayul monastery, Lahaul Valley (Himalayan foothills), Himachal Pradesh, India. Human skulls adorn the crowns on her nine heads; her weapon is an elephant-headed serpent.



Fig. 2. The basilisk, a legendary, partly ophidian, partly gallinaceous creature; end of the seventh century A.D., cloister of Saint-Benoît-sur-Loire, France. Destruction of the bird's head, or, rather, its eyes (the repository of venom), may have been intentional.

tiple fused hoods, the *nāgas* of Hindu mythology; the horned, winged, hairy, feathered, or fire-spitting species of fable and legend; the basilisk; the dragon; the anthropomorph emblematized by no more than a bifid tongue, serpent's tail, scales, or behavioral traits that are allegedly ophidian; and the limitless variety of zoomorphs whose imaginary ophidian attributes are seen worldwide in the art of both primitive and civilized peoples. All these grotesque, chimerical conceptions are serpents for the purpose of this book, which is to disclose and analyze the deep fascination the *animal* has exercised upon the human mind. It has been cursed. It has been worshipped. It would be hard to find a society that does not mingle the "insidious and cold and contemptible" ophidian aspects with the "terrible and powerful and beautiful" ones. Together, they have generated an abundance of cosmogonic, fertility, pluvial, and mortuary myths. Serpents, above all, have been made into one of the most important of cult animals.[4] Deities both malefic and beneficent mimic its salient morphological features or are emblematized by it. Is there another species that surpasses it in inciting ambivalent feelings of awe and revulsion, veneration and active antagonism? Whence spring these contradictory emotions—emotions that are displayed in the religious and secular beliefs of modern, urban peoples no less amply than in those of the very primitive?

There is indeed something extraordinary about the fascination that serpents exercise upon us through a subtle, indefinable power that distinguishes them from other beautiful and powerful creatures like birds and felids. The differences are sometimes expressed eloquently in literature. "The serpent, subtlest beast of all the field," writes John Milton in *Paradise Lost*. William Blake's well-known poem on the tiger, a tribute to its brute strength and untamed beauty, sharply contrasts with a less well-known poem, "Snake", by D. H. Lawrence. In this, his revulsive fear and initial urge to kill the venomous reptile intruding upon his pool eventually gives way, first to an ambivalent, then to a sympathetic and touching soliloquy lengthier and far more introspective than Blake's single stanza on the tiger or Lawrence's own poems on the wolf, mountain lion, and eagle. Sarojini Naidu's verses stress the divine qualities bestowed upon the serpent by Hindus but conceal the underlying dread they harbor in common with other peoples who also venerate serpents. The worldwide treasury of serpent lore expressed in myth, religion, proverbs, and literature and as personal adventure is almost limitless.[5]

It is neither convenient to do full justice to, nor possible to disregard the significance of, other animal species in a book devoted primarily to the extraordinarily diverse manifestations of serpent cults and their possible origins. It is partly through contrasts that the special fascination compelled by serpents is best appreciated, for they constitute but one among countless animal species that, each in its own manner, may, in different societies, capture attention and become the symbol of a religious cult or secular belief. Man's use of animals as symbols is universal and almost certainly stems from an early period in anthropogenesis when he lived in close harmony with nature and for varied reasons ascribed legendary significances to a large variety of species. The serpent, like any other cult animal, often serves as "natural equipment" (to borrow the expression of the theologian Nathan Söderblom)[6]—in the paraphernalia of the shaman, the "witch doctor," the "medicine man," the *curandero*, and the priest, the success of whose ritual magic is dependent upon the invocation of a

semidivine animal-spirit or animal-helper. This is exemplified by the aborigines of Australia and Siberia, among whom reptiles figure importantly, in many cases predominantly, alongside other animals that may be venerated as totems but not in any sense worshipped. Imitations of the cries and of peculiarities of motion, gait, or appearance of the totemic animal often characterize the performances of a clan's rituals. It seems highly probable that similar attention was commanded by one animal species or another during the incipient phases of evolution of religion among other primitive societies in different parts of the world. In civilized pre-Columbian Mesoamerica and ancient Egypt, innumerable deities were zoomorphic or, if anthropomorphic, carried animal insignia. In ancient Greece, priests and priestesses bore animal names and were supposed to be incarnations of the animal especially connected with the deity concerned.[7] Durkheim, Lévy-Bruhl, Malinowski, Lévi-Strauss, Evans-Pritchard, Lienhardt, and many others have approached primitive religion from diverse theoretical viewpoints that recognize the human tendency to think of animals figuratively.[8]

I do not intend to minimize the symbol-evoking qualities of species that are not ophidian. On the contrary, though it is impractical to discuss them at length, I will mention these other species whenever this is necessary and at all times tacitly acknowledge their potentialities of provoking strong emotions and religious associations even in cultures to which the serpent, as cult object, appeals in no greater degree. Why, then, should one regard the fascination of this animal as extraordinary?

Not even awareness that man has used diverse animal species as revered cult objects or as symbols of his other emotional needs should obscure the bases of the thesis advanced in this book: *that the fundamental cause of the origin of serpent cults seems to be unlike any which gave rise to practically all other animal cults; that fascination by, and awe of, the serpent appears to have been compelled not only by elementary fear of its venom, but also by less palpable, though quite primordial psychological sensitivities rooted in the evolution of the primates; that unlike almost all other animals, serpents, in varying degree, provoke certain characteristically intuitive, irrational, phobic responses in human and nonhuman primates alike; that, in this respect, the distinctiveness of man as a "logic"-employing, symbol-devising species is blurred; and that the serpent's power to fascinate certain primates is dependent on the reaction of the latter's autonomic nervous system to the mere sight of reptilian sinuous movement—a type of response that may have been reinforced by memories of venomous attacks during anthropogenesis and the differentiation of human societies.* This, I submit, accounts for man's pronounced sensitivity to the serpent and suggests that its cult may be one of the earliest of animal cults, directly rooted in fear and in the less transient ancillary condition of emotional stress caused by factors that are often only tenuously related to normal human abhorrence of this reptile. Furthermore, cultural biases sharpen and perpetuate this abhorrence in an important way. As far as I know, such an explanation, combining data from the sciences and the humanities, has not heretofore been advanced by students of the sociocultural aspects of the veneration of animals.

At least one psychologically inclined anthropologist of an older school, Wilhelm Wundt,[9] has suggested, though for quite a different reason, that in its origins the cult of the serpent may be one of the earliest. His conjectured history of mankind, including his notion of *Wechselbeziehungen*—that religion, art, language, and other traditions are ultimately products of communal interactions,

never of individuals only—is useful. He affirms that reptiles, as totems in aboriginal Australia, were much more common than other animals and therefore must be the most primitive. This is an illogical inference, but A. P. Elkin, a foremost student of Australian Aboriginal life, does confirm that the commonest form of "familiar" or "assistant" totem of the medicine man—the tribal "custodian of religious conscience"—is a serpent (and sometimes a lace lizard), most other animals generally being relegated to other categories of tribal tradition.[10] Wundt, however, attributed the origins of reptilian totems to the sight of worms (and, by extension, serpents and lizards) issuing from decaying human corpses and carrying with them, according to his estimate of aboriginal thought, the dead person's soul. These were the first subterranean species to serve as receptacles for it and consequently were the first to be venerated and play the role of totems. Metempsychic interpretations of this kind have little or no explicit endorsement as to their soundness from the tribespeople concerned and on the whole seem moot because they are not at all amenable to verification and generalization. Indeed, Wundt's idea was soon contested by Durkheim. At the cross-cultural level, psychoanalysis can no more persuasively account for the selective attention given to serpents and worms in a particular superstition in one culture than it can explain the choice of another species as a symbol of the same superstition in another culture. By contrast, fear—of certain specific types (in our case, ophidiophobia)—can be shown to be an *emotion* governed by biological factors and consequently to transcend cultural differences. Its genesis and social manifestations may therefore be examined independently of conventional (or "theoretical") psychoanalysis, though many interesting cases have been brought to light by this discipline.

The proposition that the motives which impel man to attribute symbolic significances to an animal species arise from complex, often obscure psychological factors needs little initial justification. The Iroquois custom of naming clans after animals, even though these are not at all totemic,[11] the bear cult among certain Siberian tribes,[12] the preoccupation of the Nuer with cattle,[13] and cobra worship by the Hindus[14] are cases in which peoples in their daily lives venerate, attribute supernatural powers to, or invoke animals in simile and metaphor. The fundamental reasons for these attitudes, even when they are identifiable, may not yield to generalization. One view, to be discussed later, suggests that an animal may command selective attention when certain "anomalies" of appearance or behavior make its accommodation difficult in non-Linnaean "taxonomic" schemes, usually those of primitive societies. However, this and various other reasons rooted primarily in whim or subsistence economy seem to prevail when man attaches emblematic significances to a particular species of animal. In the case of the serpent these explanations are questionable or at least quite minor in comparison with the primary determinant—fear.

The factor of fear is largely neglected in cross-cultural anthropological studies of people who exhibit sharp emotional sensitivities to animals they regard, whether justifiably or irrationally, as dangerous. Creation myths that mention a primeval, peaceful land free from illness and prowling beasts of prey are perhaps as numerous as those which speak of an initial chaos or flood. For example, the Sumerians, the most ancient civilized people with a script, seem to have had no formal cosmogony but commence one of their epic texts with an idyllic picture of a golden age when "there was no serpent, there was no scor-

pion, there was no hyena, there was no lion, no wild dog, no wolf, there was no fear, no terror, man had no rival . . . [and] the people in unison, to [their god] Enlil in one tongue gave praise."[15] Why is the serpent (followed by the equally venomous scorpion) singled out for first place? Why do not certain other dangerous animals terrify man or impel veneration whereas perfectly innocuous species occasionally do both?

Now, the manifestations of fear are easily discernible from a variety of scientific viewpoints embracing genetics, ontogenetic patterns, evolutionary aspects of physiology, and the psychology of primate behavior. Moreover, fear, as a phobic, transient reaction incited by specific phenomena, objects, and even reminders of these, is unequivocally apparent to the extent that its neurophysiological effects, such as bodily secretions and muscular tone, can be assessed by quantitative physical and chemical means in individual test subjects.[16] The rapid, complex physiological changes induced involve the spleen, rate of heartbeat, motor effects due to sudden release of sugar from the liver, dilation of pupils, dilation of bronchi, increase in lymphocytes, enhanced coagulative capacity of blood, and altered hormone levels. These effects may also be induced by anger. The measure of the distinctiveness of fear, however, is the much heavier secretion of epinephrine, rather than norepinephrine. These characteristics are genetically transmitted and separate fear from every other emotion, including the type of apprehensive "fear" elicited in an individual by, for example, feelings of guilt and impending divine retribution or societal disapproval. The collective expression of such nongenetic sensitivities is manifest in the taboos, superstitions, rituals, emblems, and myths of any society. The variables, however, are too many and too covert to permit recognition of the primary stimulus when symbol-engendering emotions of this kind are involved. On the other hand, the *recognition* of fear—in the sense of uncompounded terror or oppressive anxiety produced by an object, and sometimes by the memory of it—involves none of the uncertainties and ambiguities inherent in the nonempirical, exclusively psychoanalytic approaches of those who seek the "meanings" of symbols when interpreting human attitudes that are shaped by obscure emotions unrelated to fear.

The fascination of serpents, in short, is synonymous with a state of fear that amounts, at least temporarily, to *morbid revulsion* or phobia (in the dictionary, rather than the narrow clinical, sense) whose "symptoms" few other species of animals—perhaps none—can elicit. The primatological information in a later chapter suggests that the roots of ophidiophobia in humans are traceable to monkeys and anthropoid apes and that the *primary* stimulus emanates from a complex pattern of aversive, involuntary visuo-motor effects that differ in severity from individual to individual. Extraneous factors, including caprice, play merely an ancillary role in influencing the way in which a society may express this aversion. For these reasons we may examine its corollaries without depending unduly upon current cultural anthropological explanations of the origins of animal cults and hence should postpone a review of some of those theories.

Much has been written about the interpretation of man's symbols. Why a group of people elects a particular object as a symbol of one of its collective emotions can be a frustrating research problem. To enter this twilight zone in which cultural anthropology and nonexperimental psychology meet is to become preoccupied with opinionative exercises in the interpretation of symbols

that oblige one to align oneself with one or another of a variety of viewpoints that fail to integrate data from the sciences and the humanities. Unfortunately, the intangibles and inanities of speculative psychoanalysis occasionally permeate cultural anthropological writings explicitly beholden to Freudian or allied perspectives. I shall again touch upon this in the final chapter and here give only two examples: Mary Douglas extols Freud (implying approval of his basic ideas to justify her own view of ritual symbols) as "the magisterial figure . . . the model for appreciating the primitive ritualist"[17] and Weston La Barre speaks of "the indubitably genital symbolism of the snake" to the extent of averring that "the snake is man's own sexuality":

> The snake is an uncanny creature primarily because, like the phallus, it has an independent and autonomous will of its own. Its uncanniness is also associated with its nature as a castrated, or projectively disclaimed, member, pleasurable and dangerous, good and bad at the same time. It has a life of its own like the phallus and like the repressed wishes of the autonomous id: it becomes erect and detumescent independently of the conscious will. A snake's posture and erection, especially of the cobra's tumescent hood, is a herpetological fact available for human symbolizing. Not able to telescope its own length [unlike the turtle] . . . the roused serpent can move only with the universal-joint motion of the airplane joystick.

And, recalling the African spitting cobra, a species that can eject venom at its victim's face with remarkable aim, he writes: "no one avers that venom is semen; but is this ejaculatory behavior a source for the many Near Eastern beliefs in fire-spitting serpents? Is this the fiery serpent of the Bible?"[18] However, glib clichés about the serpent as a symbol of the phallus (or fertility), lightning, evil, water, etc., even if they have a sound basis with respect to a particular culture, give the misleading impression that the alleged symbolic associations are embedded in the human psyche cross-culturally.

The symbol-making propensities of the human mind, as I have argued elsewhere,[19] follow little reason and produce no rhyme. Moreover, in every society, they are complicated by cultural history. Anyone who "psychically" discerns hidden meanings in conceptual (in contrast to concrete) symbols is bound to encounter formidable contradictions that intensify as one attributes *motives* for the choice of a particular symbol or symbols and attempts generalizations embracing other societies.

I entirely agree with H. J. Eysenck's remark that writings involving psychoanalysis are by nature unscientific and "are characterized in general by premature crystallisation of spurious orthodoxies."[20] That is, they carry a high risk of misinterpretation. Eysenck's remarks apply primarily to Western, civilized, urban individuals psychoanalyzed by members of their own society, and understanding the minds of these individuals is difficult and uncertain enough. Psychoanalytic anthropologists who gauge the collective psyche of an entire primitive society court additional uncertainties that stem from obscure linguistic nuances and "primitive" logic or other difficulties of rapport with informants belonging to that society. Hence, without implying agreement on his other propositions, I can concur with Dan Sperber's recent reiteration of the old and well-established biological tenet of the complementarity of nature and nurture, of genetic and environmental influences. "Human learning abilities," he correctly observes, "are phylogenetically determined and culturally determi-

nant. They are determined in the same way for all members of the species; they do not therefore determine cultural *variations* but only cultural *variability*."[21] To the extent that abhorrent sensitivity to the serpent can be shown to be merely the manifestation of a specific fear with a phylogenetic, primatological basis independent of, but reinforcible by, custom and learning, and because this emotion surfaces atavistically in the art, myths, and religious traditions of different human cultures, I welcome Sperber's position as much as Eysenck's.

That psychoanalytically inclined anthropologists depend almost exclusively on exuviations such as dreams or the sentiments of subjects uninhibitedly revealing their normal day-to-day activities and attitudes is, of course, inevitable. One may mistrust their interpretations, but their case studies are highly pertinent to my main theme because they deal with the deepest recesses of the primate mind—recesses whose basic expressions biochemists, neurophysiologists, behaviorists, and experimental psychologists comprehend well enough to recognize the salient manifestations, if not the full etiology, of specific fears. Insofar as their research findings are based on observation and inference guided by the scientific method, it is sufficient for us merely to be aware of their implications to restrain conjecture rooted in Freudian, Jungian, Adlerian, or other such precepts. Nevertheless, the general subject of metaphorical thought is properly within the sphere of any inquiry connected with superstition, cult, and the human predilection for communicating by signs and symbols. Of these, the *graphic* symbols—engravings, paintings, drawings—of antiquity are the most concrete and vividly descriptive. Clearly, rather than imagining this animal as an abstract symbol of some hidden sentiment penetrable by psychoanalysis alone, it would be more rewarding, first to learn from these symbols the ways in which the serpent has stimulated human imagination and second to relate this information to certain facets of motivational behavior exhibited by individuals and groups of human and nonhuman primates.

It is obvious that categorization of the graphic (or artistic) information and other cultural traditions on the basis of geography, ethnic differences, or distinction between primitive and civilized people is quite redundant in a cross-cultural, interdisciplinary survey such as this one. This broad perspective, in my opinion, is the only useful approach vis-à-vis the serpent, though it perforce involves problems of adequately marshaling the information from diverse sources.[22] The graphic evidence ranges from the obvious to the highly cryptic, as the following few prefatory cases will show.

One of the commonest creations of ancient man is the simple zigzags and sinuosities on pottery, wood, bone, and rock. While some of these may be mere doodlings, there can be little or no doubt that others are purposeful representations of serpents (rather than of water or lightning, as has sometimes been supposed), especially if one considers each case in its particular historical and religious context. A ceramic model of a coiled serpent, dated to the Neolithic period of Yugoslavia (fig. 3*a*), is engraved on its back with a zigzag that follows the coil from nose to tail.[23] A comparable effigy is known from as far away as the largely unsettled Argentinian Chaco, where, in the vicinity of Santiago de Estero, a Stone Age culture has left relics of an ophidian cult.[24]

Relics of the Neolithic of Crete include a small clay tablet that has dubiously been identified as a spindle whorl (fig. 3*b*). It is in some ways reminiscent of the Yugoslavian effigy just mentioned, for its top side has small punctulations in

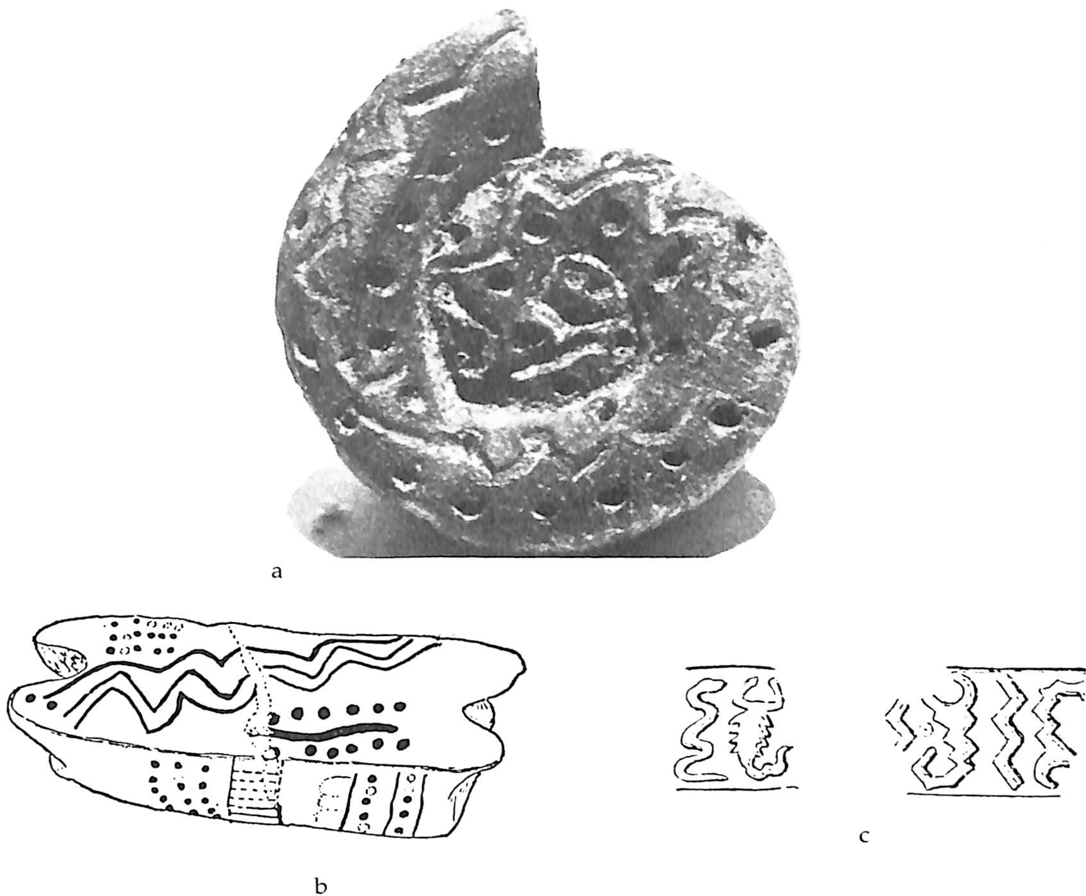


Fig. 3. *a,* Effigy of a coiled serpent, in clay (maximum diameter 3.7 centimeters), incised dorsally with a zigzag line flanked by punctulations, Vinča culture, sixth millennium B.C., Dvory nad Žitavou, Yugoslavia; *b,* clay tablet (length 7.3 centimeters) bearing a pattern of zigzag and sinusoidal incisions and punctulations, Neolithic, date unknown, Knossos, Crete; *c,* impressions of two archaic cylinder seals showing serpent and scorpion motifs naturalistically (left) and stylized conservatively (right), late fourth millennium B.C., Susa, Iran.

groups of five or six, most remarkably on either side of a short, broad, and rather wavy incision. The significance of these is conjectural, but the other motifs include a pair of parallel zigzag incisions with a single wavy one alongside them. The latter terminates with a pair of punctulations that suggest eyes, presumably ophidian, consistent with the nature of the linear motifs on this tablet and the prevalence of a serpent cult in prehistoric Crete.

Figure 3*c* shows two cylinder-seal impressions, in both of which a scorpion is obvious. A serpent is evident only in the impression on the left; the identity of the zigzag in the other impression as ophidian also can only be inferred by analogy. It is, however, the serpent, not the scorpion, for which an important cult and ritual practices are attested by at least the late fourth millennium B.C. in Elam, western Iran, the provenance of these cylinders.[25]

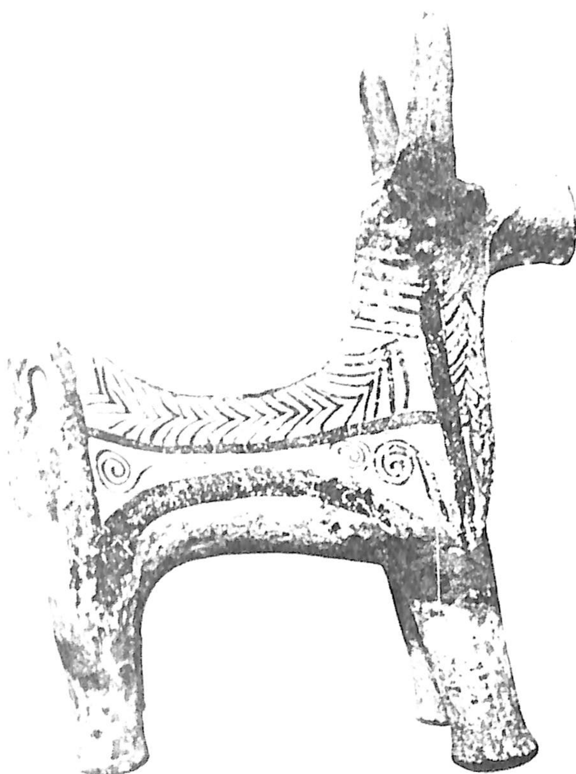
Similarly, in the terracotta images in figure 4, the zigzag over the left foreleg of the bull *(a)* clearly corresponds to the natural-looking serpent appliquéed on



a



b





the adjacent model *(b)*. Both these images are from Cyprus, where a cult involving both bull and serpent was practiced early in the island's history, certainly by the Early Bronze Age, the cult of the serpent being attested by mortuary pottery bearing zigzag and other indubitable ophidian emblems.[26] These, or allied, artistic conventions and cult practices were widespread in the Hellenic world. The series of stacked chevrons painted on the terracotta image from Mycenae *(c)* seems analogous to the markings on the Cypriot specimens. That these chevrons denote the serpent is suggested, furthermore, by the motif of line and punctulations painted on the Mycenaean bull's dewlap—a motif identical with one of the symbols occurring on the Cretan tablet in figure 3*b*. These examples directly reveal that zigzags and sinusoidal undulations (and sometimes, in the Hellenic world, chevrons) are the simplest graphic representations of the serpent or, rather, of its tortuous locomotion, this animal's most overt peculiarity. Throughout the Aegean area, cult objects found in shrines and burials exhibit many variations of motifs, including scale patterns combined with zigzag or sinuous ones, that leave little room for doubt as to the identity of the animal they signify, even in highly stylized forms (fig. 5).[27]

Outside the Aegean area, stacked chevrons are less common, and their significance is not always clear. However, two unrelated cases, from prehistoric Iran and France, are of interest: R Ghirshman categorically asserts that hatched and cross-hatched series of double chevrons painted on pottery from Sialk, Iran (ca. 3300 B.C.) signify serpents—an interpretation that is quite consistent with our knowledge of a serpent cult in Elamite Iran and borne out by obviously ophidian motifs alongside chevron or similar symbols in other examples of pottery of the period. The long rows of chevrons engraved upon dolmens of the Megalithic period in Morbihan, Brittany, also seem to be ophidian symbols. They occur alongside spirals and concentric patterns (which some identify as solar or other astral symbols) and zigzag or sinuous lines, some of them unquestionably serpent representations in that they terminate in knobby heads. Marthe and Saint-Just Péquart and Zacharie Le Rouzic argue that these dolmens are the relics of an ophiolatrous people.[28] Almost certainly, ophiolatry or a solar cult involving serpent veneration was practiced in northwestern Iberia, Wales, and Ireland, where, too, circular patterns occur on monuments of the Megalithic period together with zigzags or sinuous lines. [29] As in the monuments of Brittany, these simple linear motifs terminate in knobs or arrowheads, though often even this device of differentiating the serpent's body from its head is dispensed with. So common are such elementary symbols worldwide that one hardly need emphasize that, viewed in the context of local cults, undifferentiated zigzag and undulating motifs are often eloquent enough as ophidian symbols of more than decorative value (figs. 6,7).

It is of course the cultic and religious aspects of ophidian symbols that deserve our special attention. These symbols range from the most elementary

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Fig. 4 Terracotta bulls with ophidian emblems: *a*, stylized image marked by zigzag incision over foreleg clearly corresponding to the naturalistic image (*b*) that bears a serpent effigy in the round also affixed to the foreleg, Cyprus; *c*, chevrons and a motif occurring on the tablet in figure 3*b*, painted on an image from the late Mycenaean period, Attica, Greece.

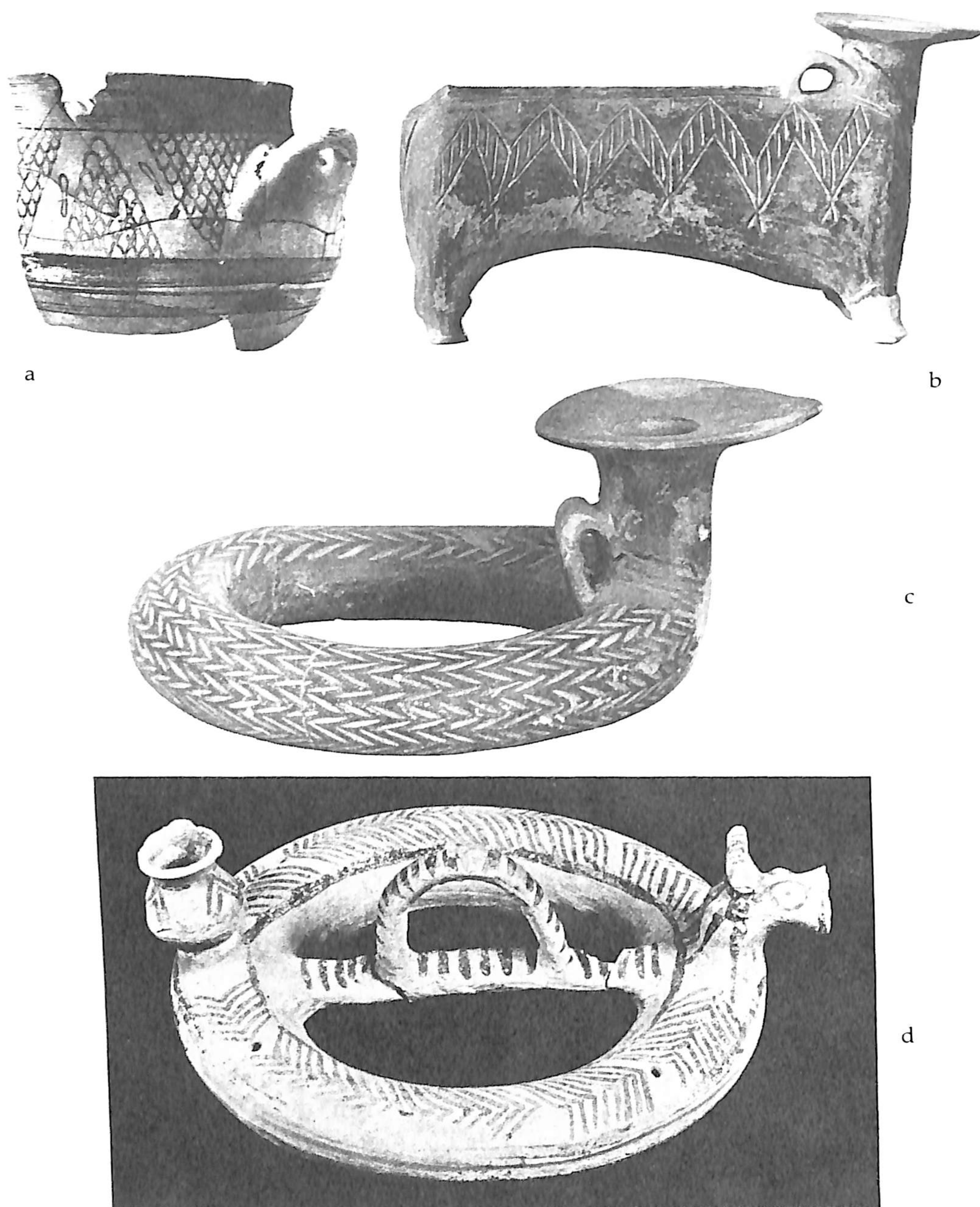


Fig. 5. Archaic mortuary pottery from the Hellenic world: *a*, painted vessel with a scale pattern interrupted by a bare zigzag pattern, Tiryns, Greece; *b* and *c*, incised zigzag on a rhyton in the form of a headless bull and white-filled chevrons on a "serpent-ring vase," Phylakopi, the Cyclades; *d*, ring-shaped vessel with bucranium and painted chevrons, Cyprus. Ophidian symbolism is implicit in these examples (compare with figures 3, 4), but, viewed out of religious contexts, their immense variations often defy recognition—or extract no commitment by their catalogers as to the identity of obscure symbols.

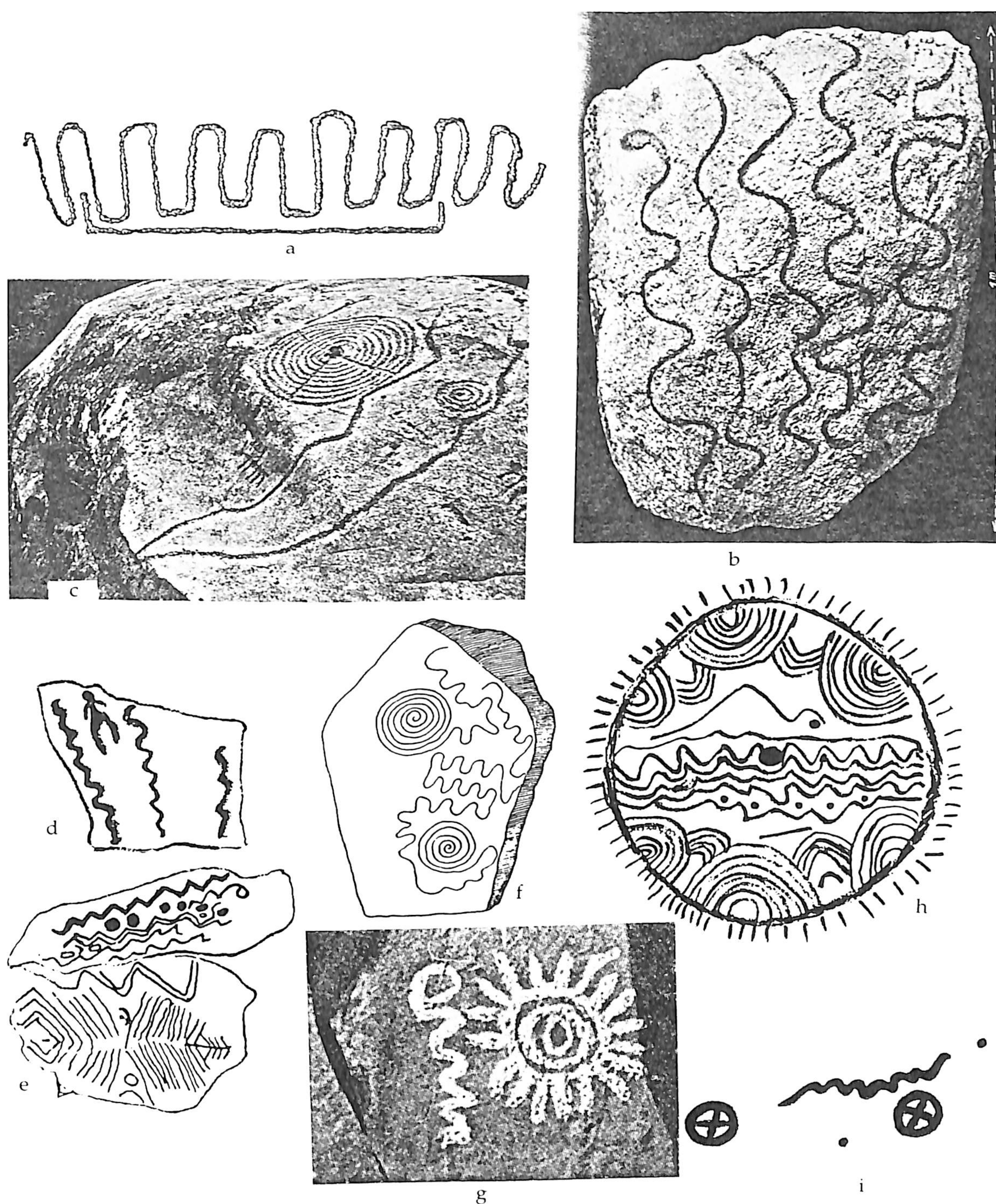
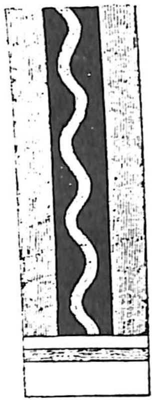


Fig. 6. Ophidian and solar cult symbols in petroglyphs: *a*, fourth millennium B.C., Knowth, Ireland; *b*, Megalithic period, Manio, Brittany, France; *c*, Early Bronze Age, Carschenna (alt. 2,000 meters), Switzerland, *d*, *e*, *f*, Megalithic period, Portugal; *g*, unknown prehistoric period, Nevada, U.S.A.; *h*, probably post-Palaeolithic, Talat n'Iisk, the Grand Atlas, Morocco; *i*, Palaeolithic, Skåne (latitude 43° N), Sweden.


a


b

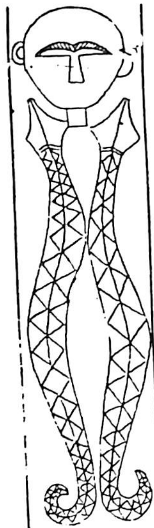

c


d

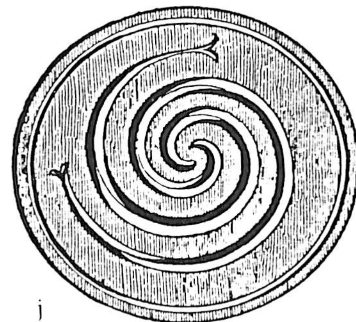

e

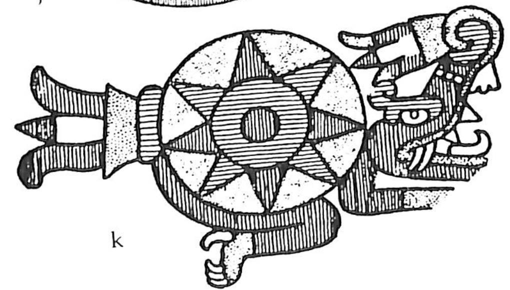

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painted versions or etchings on crudely made objects of primitive peoples to the elaborately artistic creations of economically powerful societies. Discerning these symbols and their purposes is not always easy. In figure 8, showing the tooth of a mammoth excavated at the eastern Siberian Palaeolithic site of Mal'ta, the three obviously ophidian figures and the swirling (cosmological?) motif of dots etched on the opposite surface suggest that the object was used in rituals or as a talisman, particularly because a hole is bored through its center, probably for suspension by a cord.[30] Similarly, the purpose of the scalloping on the broad end of the deer antler in figure 9 was most probably to secure a thong around it for suspension.[31] In this relic of the Epipalaeolithic Schela Cladovei culture of southwestern Rumania, the ophidian significance of the zigzag motif with knobbed end can hardly be doubted. The wall of at least one excavated Rumanian cave of the period bears a large painting of a serpent. More importantly, the Schela Cladovei culture preceded a number of Neolithic cultures of Rumania—Starčevo-Criş, Vinča-Turdas, pre-Cucuteni, and Cucuteni—in whose idols and mortuary pottery serpent motifs are striking.

In contrast, the difficulties of interpreting the more cryptic relics of antiquity should also be acknowledged: The Schela Cladovei and the neighboring Lepenski Vir culture of Yugoslavia were coeval (6800–5500 B.C.), occupied the left and right banks, respectively, of the Danube, and shared certain material traits and perhaps some cultural ones such as religious and mortuary practices. Dragoslav Srejović, citing at least one serpent effigy in sandstone excavated from a dwelling at Lepenski Vir, writes that it "seems likely to have been a magic instrument in the hands of the person who healed members of the community from the bite of poisonous snakes."[32] The abstract ceramic and lithic art of Lepenski Vir is rich in parallel zigzags, chevrons, and meandering, intertwining patterns. One cannot a priori assume that all are ophidian symbols, though some of them may be. How, then, is one to interpret the sinuous bone object (fig. 10) of the Danubian Epipalaeolithic of Phase I, ca. 8300–6800 B.C., from Lepenski Vir[33] and the metallic objects of the much latter Middle Bronze Age (fig. 11)? Archaeologists cautiously label them "ornamental bone pins" or "bronze needles." Might they have meant more to their makers? They were, it would appear, chiefly of ritual value, for the bronze specimens were found buried near corpses, often of children, in graves containing few or no grave goods or sometimes only minor vessels.[34] These specimens are from Austria, but similar ones of the Bronze Age are also known from burials in Hungary and Germany and, farther away, in Switzerland and northeastern Italy. P. V. Glob

Fig. 7. Ophidian motifs in ceremonial objects: *a*, ornamentation on a shaman's headband, *b–f*, wooden moustache sticks, and *g*, paddle for stirring rice and sake traditional among aboriginal Ainu of modern Japan, who specifically identify the designs as ophidian; *h* and *i*, wood carvings of deities with human head and serpent's body, of the Puyuma of Taiwan and Solomon Islanders, respectively; *j* and *k*, Gilyak (eastern Siberian) wooden disc and Mexican (Aztec) pottery emblem, respectively, portraying the sun as a pair of coiled serpents and as a ball carried by the mythical fire-serpent Xiuhcoatl; l–q, wooden representations of serpents used in a mortuary cult of ancestors believed to have descended from a primeval serpent, Dogon culture, Mali. The longest of the specimens (here compared with a man of normal height) measures 10 meters.

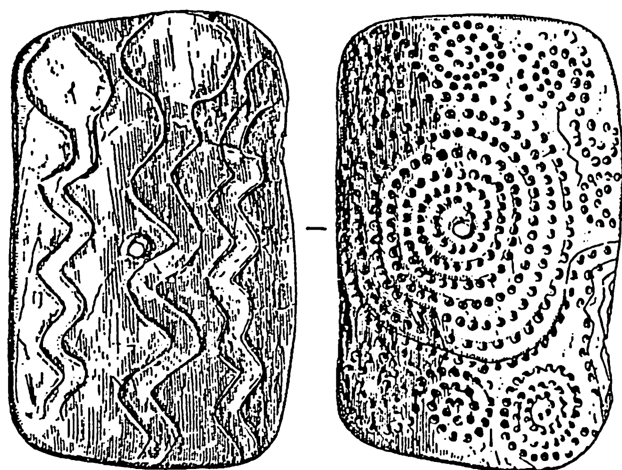


Fig. 8. Patterns engraved upon two faces of a mammoth's tooth, Palaeolithic, Mal'ta, Siberia.

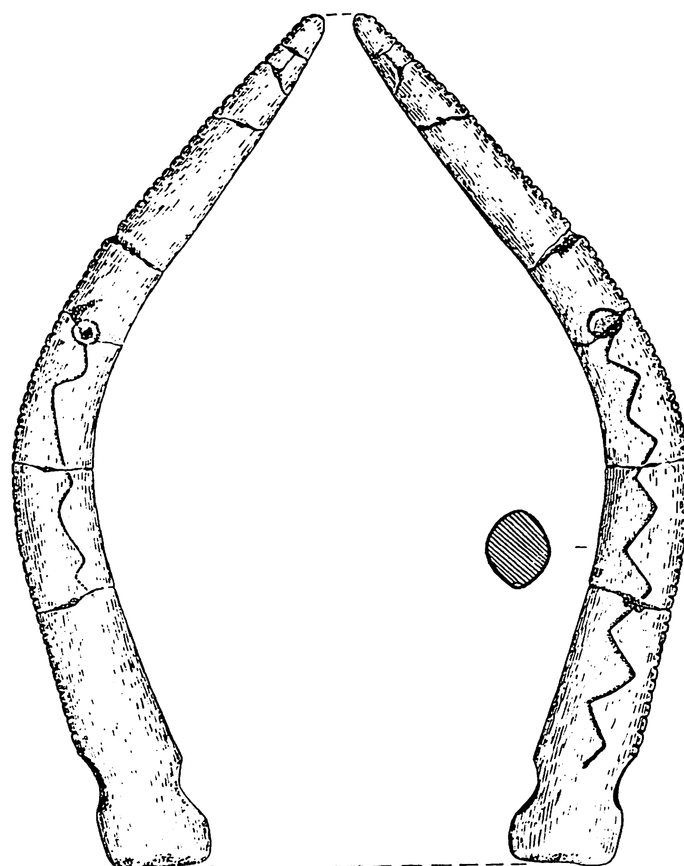


Fig. 9 Deer antler of the Schela Cladovei culture, Epipalaeolithic, Rumánia.

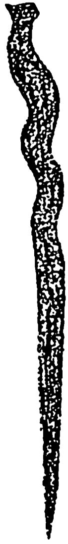


Fig. 10. "Ornamental bone pin," Lepenski Vir culture, Epipalaeolithic, Yugoslavia.

describes numerous artifacts with ophidian motifs, including a "snake goddess" of a Danish Bronze Age cult (whose roots probably lay in the Stone Age) brought to light partly through discoveries of the remains of "priest-chieftains" or "medicine men." The "tail of a grass-snake, a falcon's claw . . . and the lower jaw of a young squirrel" were the only animal parts (presumably used in rituals) comprising the odd paraphernalia found in a small pouch lying among the burnt bones of one such adult male.[35] Glob mentions serpent and stag or antler motifs frequently in relation to northern European Bronze Age religion and burials. The Lepenski Vir burials, too, were quite simple, the placing of deer antlers near the corpse being an essential part of the funerary ritual. It is in these contexts that the sinuous bone "pin," the zigzag engraved on the Schela Cladovei deer antler,

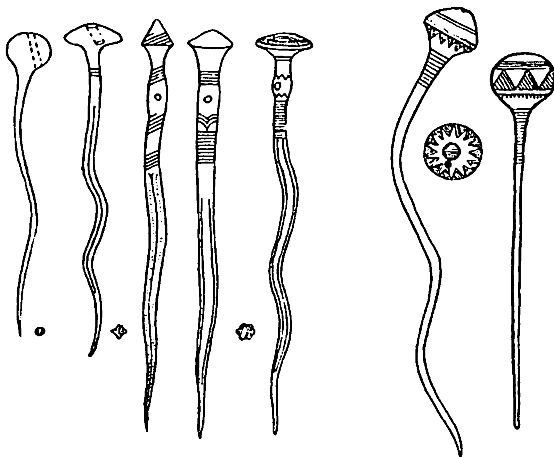


Fig. 11. Bronze "needles," Bronze Age, Austria.



Fig. 12. Incised clay idol of the Bükk culture, Neolithic, Tiszadada-Calvinháza, northeastern Hungary.

and the "bronze needles" arouse one's interest and seem more than utilitarian or ornamental.

Because religious art is often allegorical or mystical, its motifs are at times apt to elicit unduly guarded assessments that inhibit a forthright, even if tentative, estimation of their significance. This is well brought out by Herbert George May specifically in relation to the serpent cult of ancient Israel—now archaeologically better attested than in his time from finds of objects which are not obvious as cultic ones, "though all are associated somehow with the religion of ancient Megiddo." He reports with regret:[36]

> Mother-goddess figurines become dolls, animal figurines and rattles become toys; and the snake, dove, tree, and pomegranate motives pure decorations. . . . There has perhaps also been a hesitancy in this matter through a dislike to imagine the Hebrew cult quite as polytheistic and syncretistic as would be indicated if these objects were a part of the cult. We cannot neglect the evidence of the Old Testament records . . . [concerning] the snake image to which sacrifices were made [and other] recognized parts of the temple cult in spite of a protest against them on the part of an idealistically minded minority.

It may be that special theological and historical factors account for the reluctance seen by May, but one might expect much less of this outside Judaism. It is,

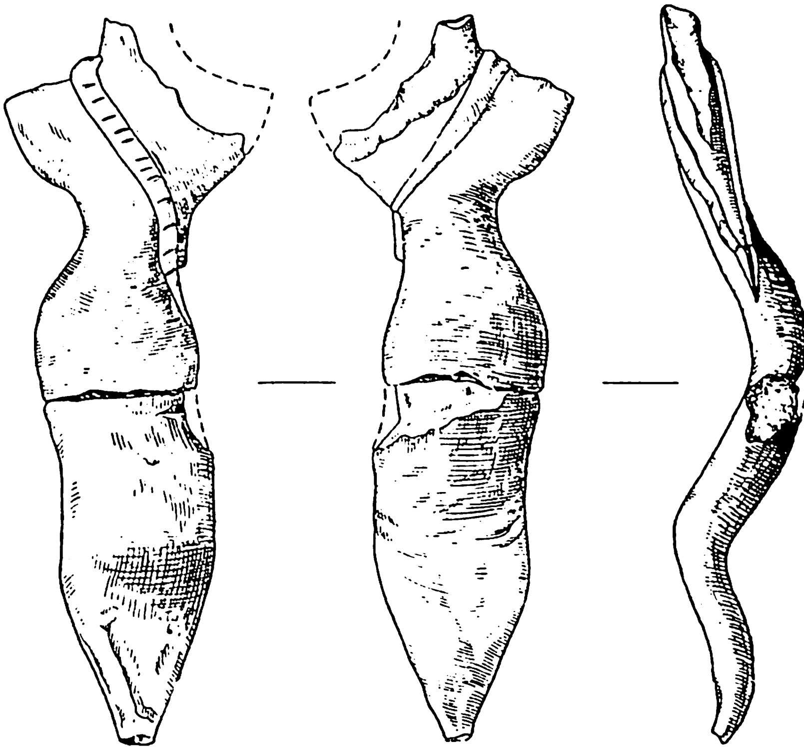


Fig. 13. Clay figurine from Meshoko, Maikop burials, Eneolithic, Early Kuban culture, northern Caucasus, U.S.S.R.

however, not unusual to find an overcautious neutrality among writers who unwittingly withhold from the serpent its due share of recognition as an extraordinary cult animal.

The highly stylized, crude clay image from Tiszadada-Calvinháza (fig. 12), one of the most striking relics of the Middle Neolithic Bükk culture of eastern Hungary (ca. 3000 B.C.) is justifiably regarded as an important example of a type of idol represented chiefly by fragments at other sites. Flat and free-standing, heads of this type are generally triangular. The Tiszadada image is clearly designed for suspension, perhaps from one's neck, by two holes near the edge of its head. Pieces of shell pressed into the clay mark the mouth and eyes, and female human breasts are plainly indicated. The lines of a triangle with a broken base, incised at the head level, continue downward as a distinct bundle of parallel zigzags in the midst of extraneous ones. Its compactness (height 10.1 centimeters), suspension holes, flatness, and especially the pattern of lines, in my opinion, all suggest that this image, perhaps a talisman, is that of a deity conceived in the form of a serpent. However, it has guardedly been described by Nándor Kalicz as "a clothed human figure" whose "ornamentation presumably imitates some kind of animal skin."[37] Such an estimate only veils the probability that the idol—a representative of an eastern Hungarian Neolithic culture recognized by him as a northern extension of ethnic elements of coeval Aegean cultures—shares with the latter the two principal elements found in the iconog-

raphy of a fertility cult: female breasts and genitals (represented with artistic license by a triangle, sometimes mislocated) and the serpent. The symbolism conveyed by the Bükk icon maker is as noteworthy as his imagination: he portrays the pubic triangle simultaneously as human face and serpent's head. In addition, the latter two share a single pair of eyes without its affecting their realistic positions in either case.[38]

The Trans-Caucasian and south-central Asian regions comprise an extensive territory in which diffusions of art motifs and religion have been almost continuous throughout prehistory. Chevrons and zigzags often occur on rock monuments around human burials in long, formal series whose ophidian significance is usually not so directly apparent as in other regions of the world. These petroglyphs have been documented by many,[39] and Alexander Häusler specifically remarks on the evidences of a serpent cult and cites various instances of skeletons of these animals discovered in elaborate association with human corpses of the Megalithic and Eneolithic periods of the Caucasus. A. A. Formozov's account of the Eneolithic burials at Maikop (near Krasnodar) includes a remarkable clay figurine (fig. 13). In frontal view it has a feminine contour with pinched waist and wide hips. In profile, however, these are strikingly undifferentiated. The only clues as to the animal this figurine almost surely represents lie in the appliqué band of clay across the shoulder and torso and in the sinuous, tapering profile of the piece as a whole. However, its cataloger is reluctant to commit himself by stating more than that it is "a statuette of a person" or "a living creature" (Russian *zhivotnoe*).[40]

Another class of image found in burials represents women as markedly steatopygous, for a specimen of which one need wander only to the eastern side of the Caspian Sea. That the painted figurine from southern Turkmenia (fig. 14) is apparently a fertility idol is suggested by the pubic triangle and prominent breasts. Its cataloger[41] states that the circular motifs on the hips and thighs may be calendrical; he ventures no opinion about the chevrons on the right hip, though these seem to be no more, or no less, ornamental. Yet, the intriguing possibility exists that the chevrons are an ophidian symbol if one is aware of other figurines, such as the one in figure 15, from the same cultural area and approximately the same epoch—the fourth to early third millennium B.C.[42]

The graphic symbol of the serpent least likely to be elusive is that inspired by the form of its tongue. No other animal—not even among the reptiles, except for the single tropical Old World genus of nonvenomous lizard, *Varanus*—is characterized by a really long, highly protrusible bifid tongue.[43] Yet, hesitance or neglect to ascribe ophidian qualities to objects that portray this morphologically unique tongue is not uncommon. This is exemplified by a description of finds of the Cakran period of Albania, whose "abstract" and "linear geometric" motifs (including zigzags, chevrons, etc.) on painted pottery are widely recognized as comparable to those of the Middle Neolithic of central Greece. In addition, its ceramic products are likened to those of the Starčevo and other Danubian cultures already mentioned. Now, *Varanus* is unknown anywhere in Europe, whereas there is good evidence that traditions of ophiolatry in the southeastern parts have ancient, widespread roots. But despite its motifs of an obviously ophidian tongue, meanders, and zigzags, its nonhuman countenance, and its humanoid, female torso, the handsome jar from the Neolithic Albanian

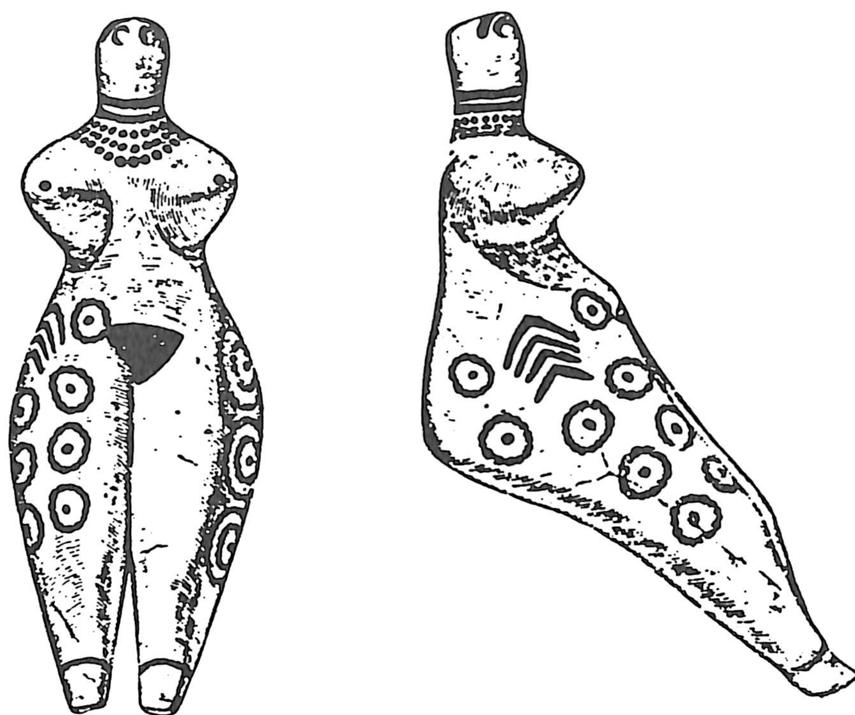


Fig. 14. Steatopygous painted clay fertility figurine, Namazga II, late fourth/early third millennium B.C., Yalangach-depe, Turkmenia, U.S.S.R.



Fig. 15. Steatopygous fertility figurine, Namazga III, early third millennium B.C., Kara-depe, Turkmenia, U.S.S.R.

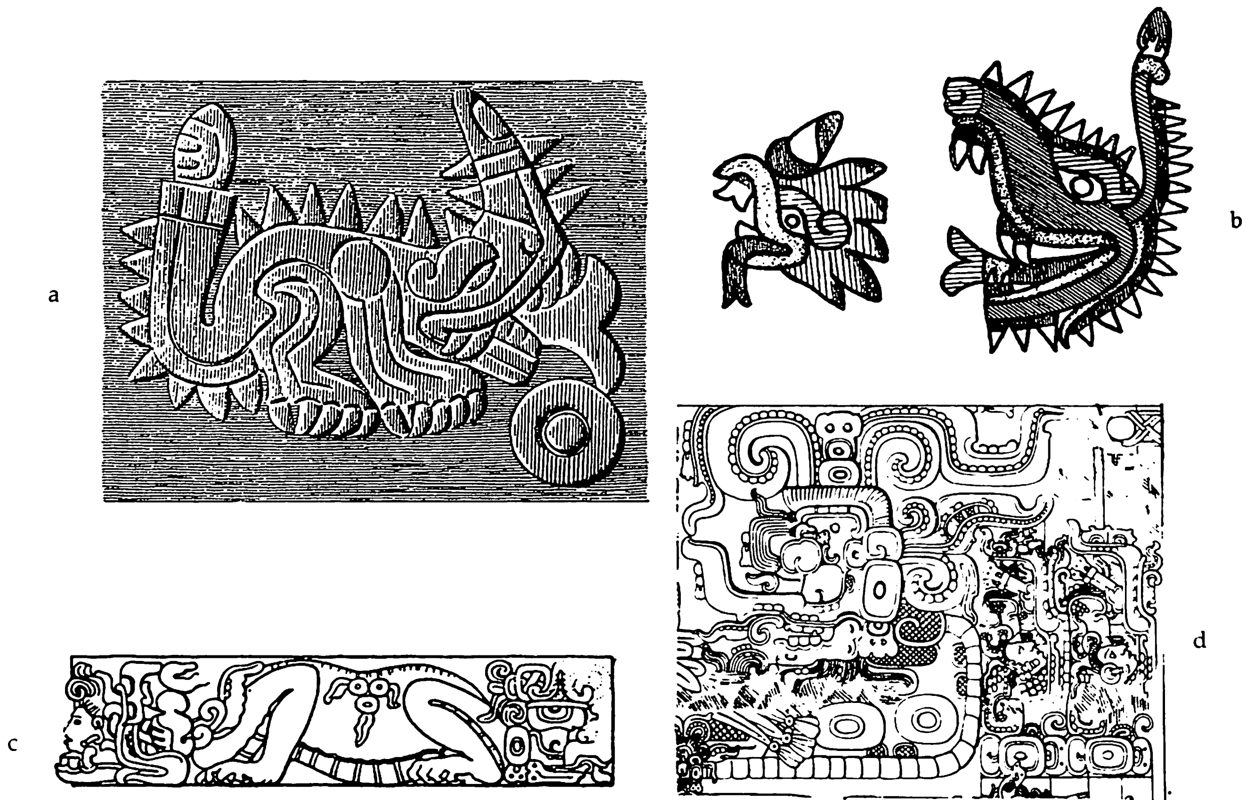


Fig. 16. *a* and *b*, *cipactli*, the Aztec calendrical symbol "earth crocodile," showing bifid tongue and rattlesnake's tail; *c* and *d*, Itzam Na, an "iguana-like" Maya god, with uniquely ophidian gastrostege (ventral or "belly") scales. A large, bifid motif adorns the head of image *d*.

burial site of Kamnik (frontispiece) has evoked no special comment. Its cataloger refers fleetingly to the excavation of "anthropomorphic" idols of clay,[44] though this jar has subsequently also been referred to as "zoomorphic."

Pre-Columbian Mesoamerican symbols, particularly those of the Maya/ Aztec religious calendar, include creatures commonly called "earth crocodile" (*cipactli*), "iguana earth crocodile (*itzam cab ain*), and "lizard" (*cuetzpallin*). The crocodilian and lacertian affinities, however, are vitiated by the fact that the archetypal species of none of these creatures of fantasy is important in Maya/ Aztec traditions, whereas the rattlesnake is outstandingly so. The Mesoamerican sculptor endowed florid hydrids with its hallmarks—bifid tongue, ventral scales, and rattles—in some instances so subtly that these features elude us (fig. 16).

In their art practically all cultures portray the bifid tongue as if it were the quintessential ophidian symbol, sometimes to the extent of stylizing this simple motif or locating it whimsically on the creature's body. Three examples will suffice: In Middle Egypt, from about 2000 B.C. onward, the cobra deity Netjer-ankh ("living god"), usually depicted on coffins, often carried a design that is identified with the major goddess Neith.[45] This emblem consists of a pair of bifid processes whose ophidian symbolism may seem obscure, for they are joined to a

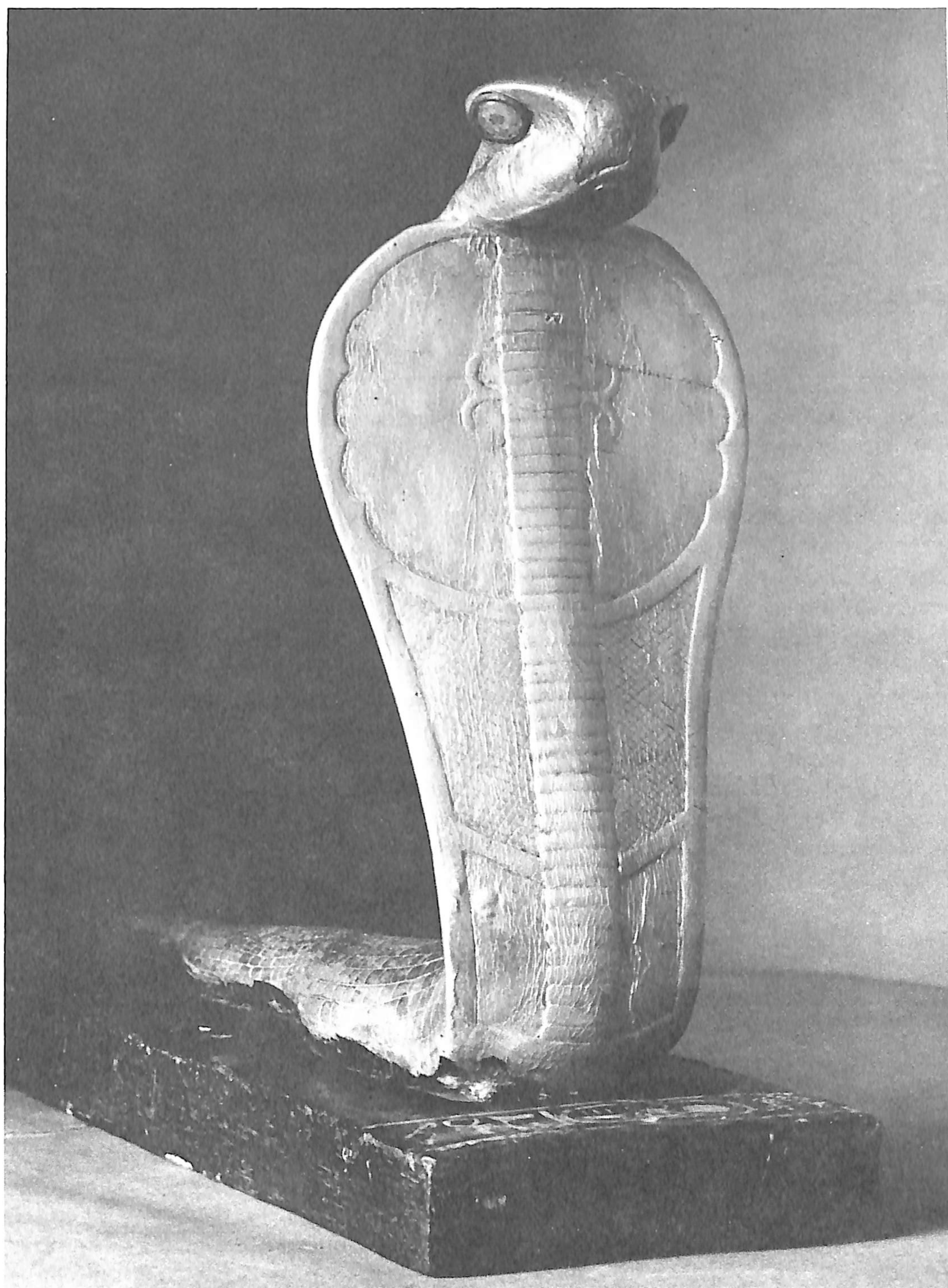


Fig. 17. Gilded wood image identified by an inscription on its pedestal as Netjer-ankh, "living god." A pair of bifid processes occur on this Egyptian cobra deity's hood. They point in opposite directions, probably east and west, of central importance in Egyptian religion. Presumably they symbolize the deity's tongue, though the motif is generally identified with the creator goddess Neith. Amulets in gold marked "Netjer-ankh" were included in the wrappings of the pharaoh Tutankhamen's mummy, ca. 1325 B.C.

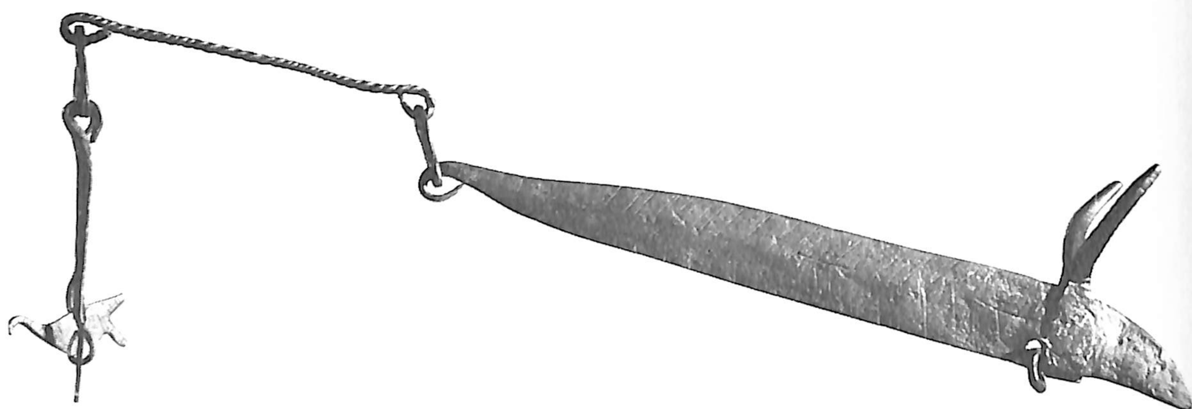


Fig. 18. Metallic *ongon* used in the Siberian shaman's seance, generally as a talisman against sickness or disease. Yakut culture, contemporary.

common base, point in opposite directions, and are positioned centrally on the ventral surface of the cobra's spread hood (fig. 17). The *ongon,* or talisman, in figure 18 is from a Yakut shaman's costume. The museum label[46] represents it merely an as "animal of the subterranean world," though—despite the unconventional form and placement of the bifid tongue—its reptilian identity is clearly suggested by the stylized body as well as the fact that Yakut, Tungus, and numerous other Siberian tribes possess strong ophidian traditions. The tongue and head are emphatically, though not always clearly featured in ancient pictographic scripts. In cuneiform writings from Mesopotamia, at least sixteen nuances of signs identify mythical and natural species of serpents on the basis of the word *muš,* whose meaning is beyond doubt traceable to the simple ideogram at the extreme left of some of the variations shown in figure 19*a*. In archaic Chinese ideograms (fig. 19*b*), one form of the glyph "serpent" is highly suggestive of a rearing reptile with knobbed head and a simple T-shaped bifurcation in front, presumably signifying the lobes of the tongue. Glyphs like these—inscribed on shoulderblades of oxen or plastrons of tortoises, the so-called oracle bones—record divinatory rites practiced during the Shang period, mid-second millennium B.C. The grapheme that specifically denotes "the curse [of a bite brought upon oneself by] unintentional treading upon a serpent" consists of one of the variant glyphs for serpent with the glyph "foot" added as superfix. While it may or may not be a coincidence, it is remarkable that the glyphs "foot," "open mouth," and "tongue" are somewhat similar to each other in form among the great variety of archaic Chinese divinatory signs translated by Tsung-tung Chang.[47]

In the rock paintings of the Lake Victoria region, particularly in Uganda, portrayals of identifiable wild animals (other than a solitary case of a "pangolin") are reported to be virtually absent. Zigzags are common, and J. H. Chaplin[48] interprets them as ophidian symbols. He stresses the python cult and ophiolatry practiced by the tribes of the region, but he tends to believe that symbols like those in figure 20*a* represent cows' horns, since a cattle cult is also very strong around Lake Victoria. Other area experts prefer to see them as symbols of human beings. Conflicting opinions like these reveal the need for caution in interpreting an art motif involving bifid processes by equating the latter with the

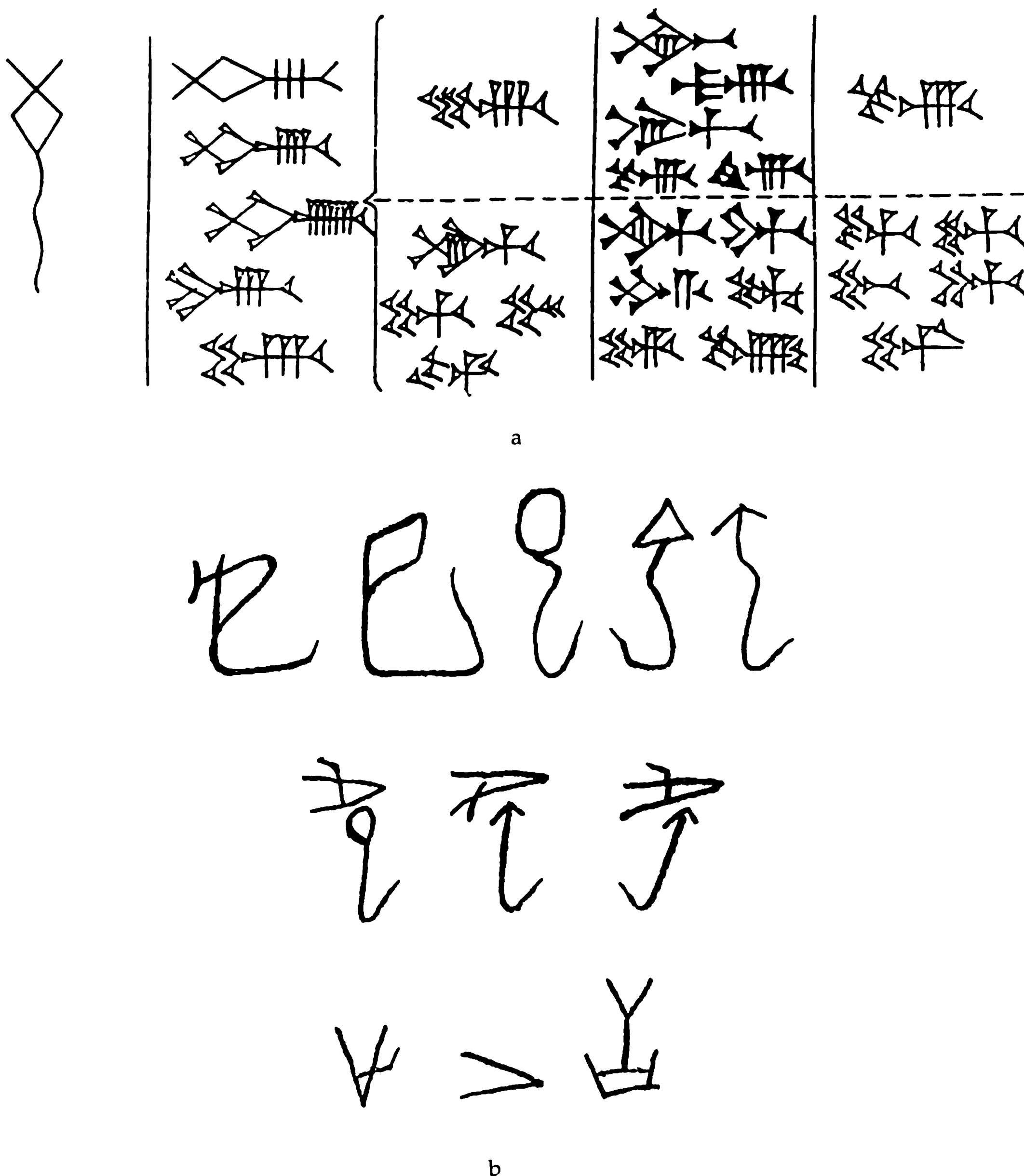


Fig. 19. The glyph "serpent": *a*, in ancient Mesopotamian cuneiform script, where the basic word *muš* is expressed by an accurate pictograph that contrasts with numerous variants for the different natural and mythical species, only a few of which are included here; *b*, in the archaic script of Shang China, ca. 1500 B.C., with some of its variants (top row), instances of the grapheme "snakebite" (middle row), and the glyphs "foot," "open mouth," and "tongue" (bottom row).

serpent's tongue. But the interpretations so far given to them seem moot, if not weak, and M. G. Kenny's recent detailed discussion of serpent and sun cults vis-à-vis East African rock art[49] only fortifies my conviction that the earlier interpretations are incorrect. Moreover, it is noteworthy that bifid processes linked to concentric circles ("solar" symbols?) are also known in the rock art motifs of

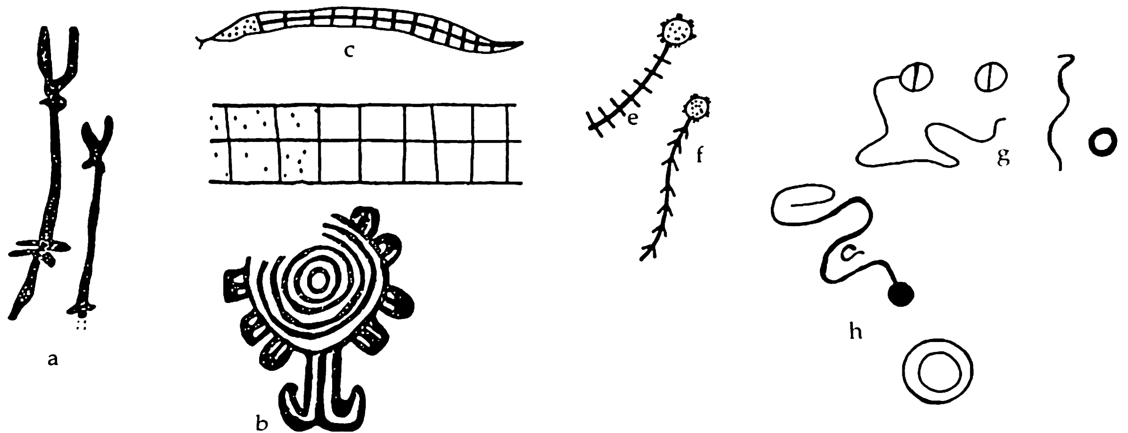


Fig. 20. Ugandan and Kenyan petroglyphs: *a* and *b*, presumably bifid tongues; *c–f*, serpents and their ribs; *b*, *g*, and *h*, symbols revealing solar associations.

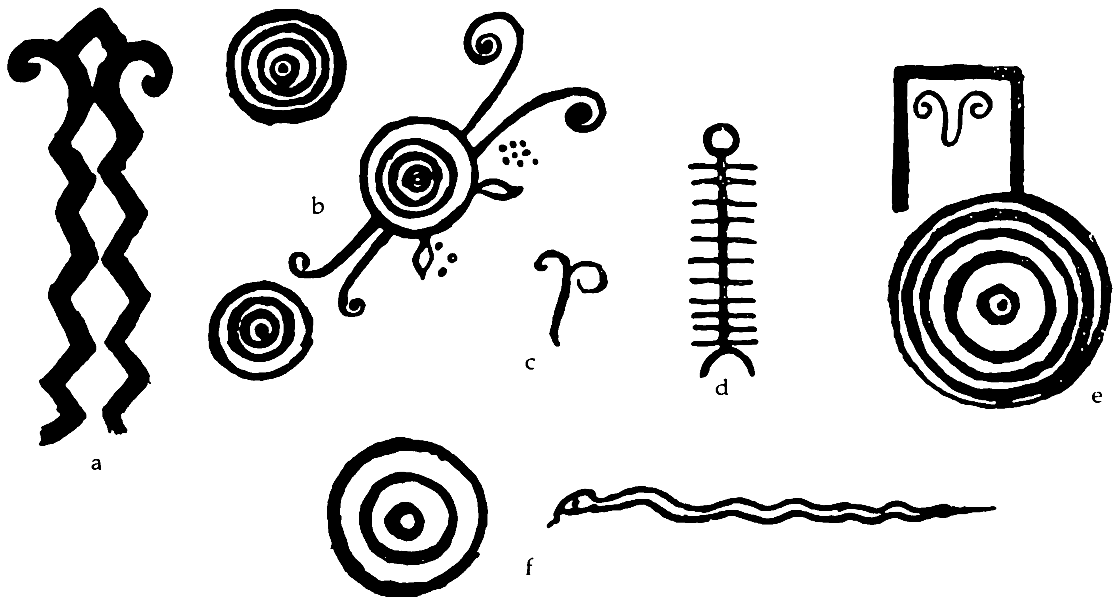


Fig. 21. Petroglyphs from Venezuela. The significance of the pattern in *d* is elusive; it may represent a stylized human figure or a double-headed serpent (very common in South American myth and art), as is suggested by the knobbed head at one end and bifid tongue (?) at the other.

other parts of the world. There are almost precise parallels to some of the Ugandan motifs, for instance, in Venezuela, where the petroglyphs (fig. 21) are indubitably of serpents[50] and pose no problems of interpretation. The symbols include not only those for the tongue, but also those for the serpent's ribs.

I shall only briefly mention the two or three other features of the serpent's simple body form that are available for exploitation as graphic symbols.

The array of large ventral gastrostege ("belly") scale plates along the entire length of the animal is a uniquely ophidian trait that, along with other evi-

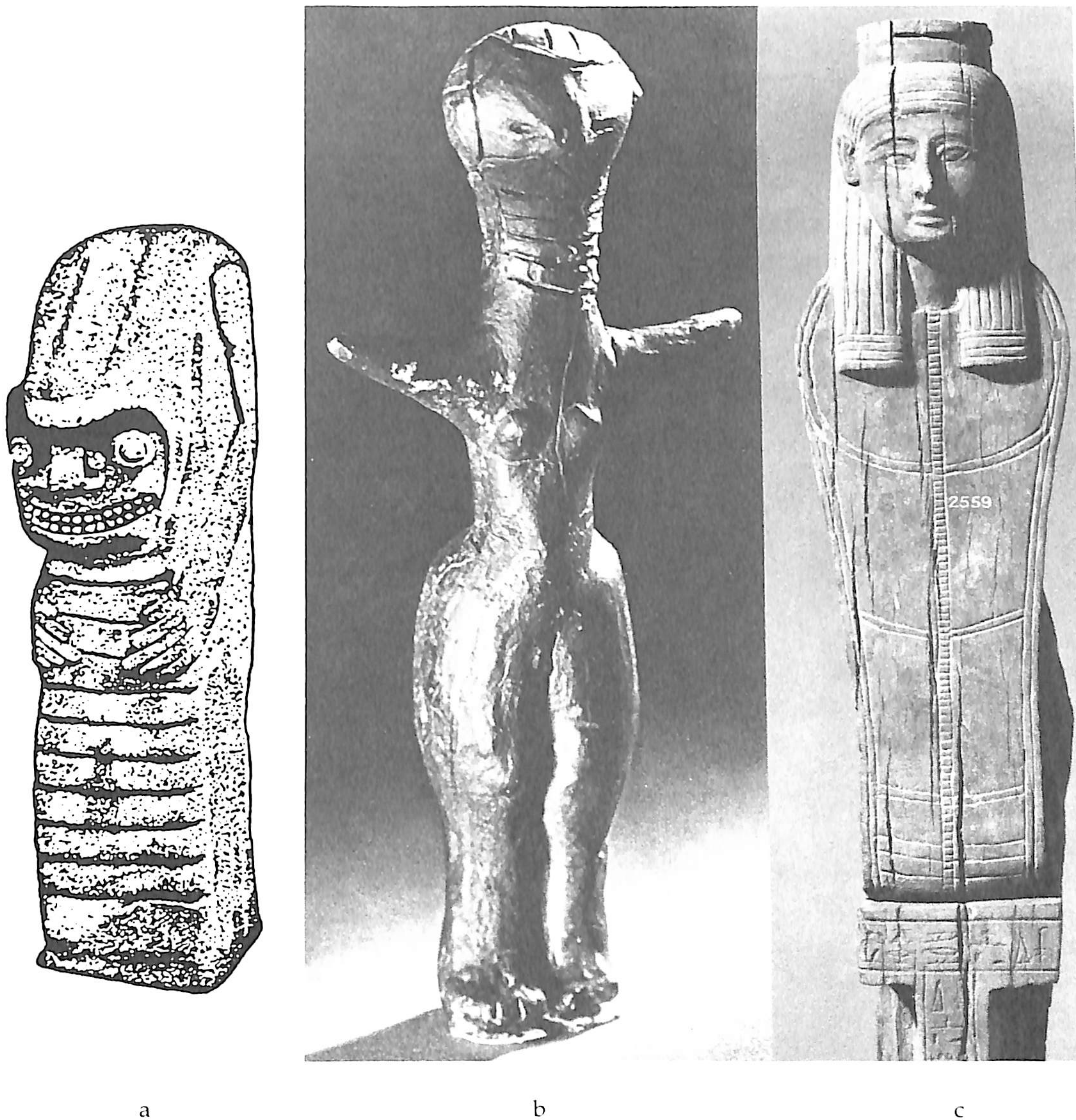


Fig. 22. Gastrostege (ventral or "belly") scales in religious art: *a*, monolith from a pre-Columbian mound temple in Colombia; *b*, fertility idol of the Neolithic of Czechoslovakia, with neck incisions which (consistent with other clearly ophidian artifacts of the region) probably represent the gastrosteges; *c*, the Egyptian goddess Mertseger, represented in wood with a human head substituting for a cobra's and gastrosteges on the hood that are almost imperceptible because of their unnaturally small size and great numbers. Compare with figs. 17 and 23*e*, *f*.

dences, establishes the identity of the archetypal reptile manifest in the Chinese dragon, the basilisk, the Sumerian *muš-huš*, the monoliths from a mound temple in Colombia, the scaly-necked idol of a woman from Czechoslovakia (fig. 22), and others.[51]

In contrast to the ventral scale plates, the scales of the head (fig. 23) are the only ones that vary sharply enough—in number, shape, size, and arrangement—to be useful as criteria for scientifically distinguishing one species of

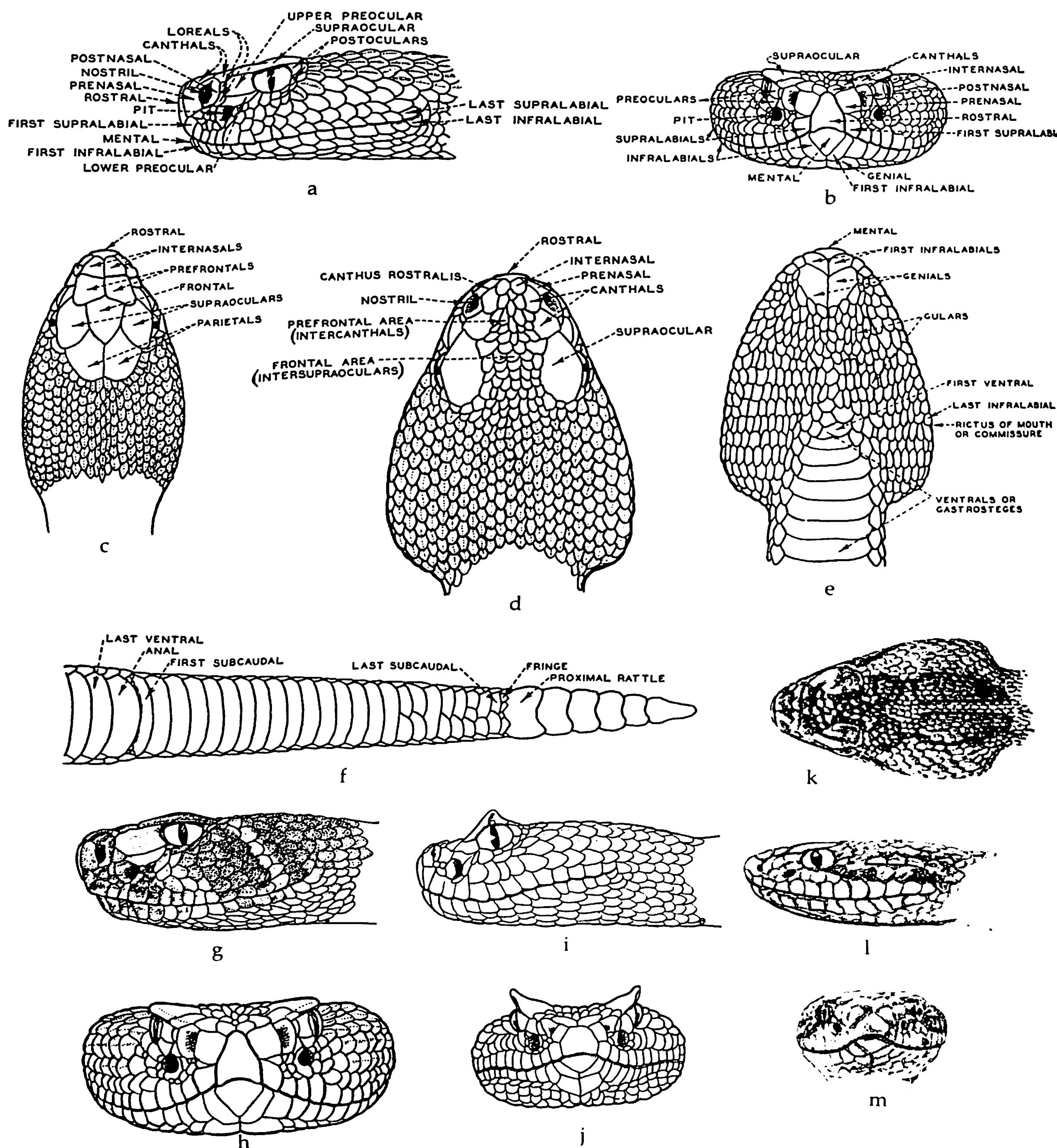


Fig. 23. Nomenclature and differences is squamation in four species of Mexican rattlesnakes: profiles of the heads of *Crotalus atrox (a, g)*, C. *triseriatus anahuacus (l)*, C. *cerastes (i)*; front view of the heads of C. *atrox (b, h)*, C. *cerastes (j)*, C. *triseriatus anahuacus (m)*; dorsal view of the heads of *Sistrurus ravus (c)*, C. *atrox (d)*, C. *triseriatus anahuacus (k)*; and ventral view of the head, tail, and rattles of C. *atrox (e, f)*.

serpent from another. The differences are apt to be overlooked by the casual viewer, but, prompted by appearances or numerological analogies, some observant cultures have skillfully imitated, or exaggerated, these distinctive head-scale characteristics in their symbolic art. Thus, the prominent, raised and pointed supraocular scales of some vipers are logical models for the horned monsters of fable and legend. Of equal interest is the fact that within the rattlesnake genus *Crotalus* the number and size of the supra- and infralabials differ not only from species to species, but also between the upper and lower lips of an individual of each species. For instance, the upper/lower labial scales in average adult individuals of *C. triseriatus pricei* and *C. molossus* number nine/ten and seventeen/eighteen, respectively. One of the rare exceptions to such discrepancies is *C. triseriatus anahuacus*, widespread in the southern Valley of Mexico and in the states of Puebla, Morelos, Veracruz, and parts of Oaxaca. This subspecies averages twelve supra- and twelve infralabials, or thirteen each if one begins the count with the rostral and mental scales common to the series on the right and left sides of each lip (i.e., common to a total of four series). Now, the significance of this is that thirteen times four is fifty-two and that these and certain auxiliary numerals played a decisive role in the construction of the religious calendar of pre-Columbian Mesoamerica. To the principal cultures such as the Maya, the Mexica, and possibly also those of early Oaxaca and Teotihuacan, the major cycle of time consisted of fifty-two years. The fundamental cycle involved thirteen numerals (from 1 to 13), and these were paired, sequentially and rotationally, with twenty name-bearing days. Thirteen "months" of twenty days each constituted a ceremonial year of two hundred sixty days. In beliefs about the sun, cardinal directions, and the Cycle of the Great Ages, the key numeral was four. Apparently, these numerals possessed mystical significances. This is analogized in a polished stone image of an open-fanged rattlesnake (fig. 24*a*)—presumably *C. triseriatus anahuacus*—excavated from the principal solar temple of the Aztecs, at their capital city, Tenochtitlan. Its otherwise scaleless body contrasts starkly with exactly thirteen scales carved on each side of the upper and lower lips—thirteen times four, or fifty-two labial scales. These are not to be confused with rows of non-fang teeth, which, in rattlesnakes, are considerably fewer, tiny, and concealed. In addition, exactly thirteen rattle segments are portrayed at the tail end, though in nature their number fluctuates erratically because of accidental breakage and other factors and rarely exceeds five or six. The large platelike, dorsally prominent supraocular ("eyebrow") scales are damaged in this sculpture; evidently these too were emphasized artistically.

The peculiarities of squamation around the rattlesnake's mouth provided yet another analogy in symbol making: A comparison of figure 23*b* (or *m*, *h*, and *j*) with figure 24*b* will show that the shape and arrangement of the rostral, mental, prenasal, internasal, first supralabial, and first infralabial scales of a number of species, including especially those common in Mesoamerica, correspond roughly to the form of the pre-Columbian cosmic symbol called *olin nahui*. This was an essential element in the calendrical art of the group of cultures known as the Mexica.[52]

These parallels are not fortuitous, for the motif of the rattlesnake recurs inordinately in the religious ideas and monumental art of all historical periods throughout Mesoamerica. At the Pyramid of the Sun at Tenayuca, effigies of venomous Crotalidae (includes nonrattlers) are very stylized, but it is easy to

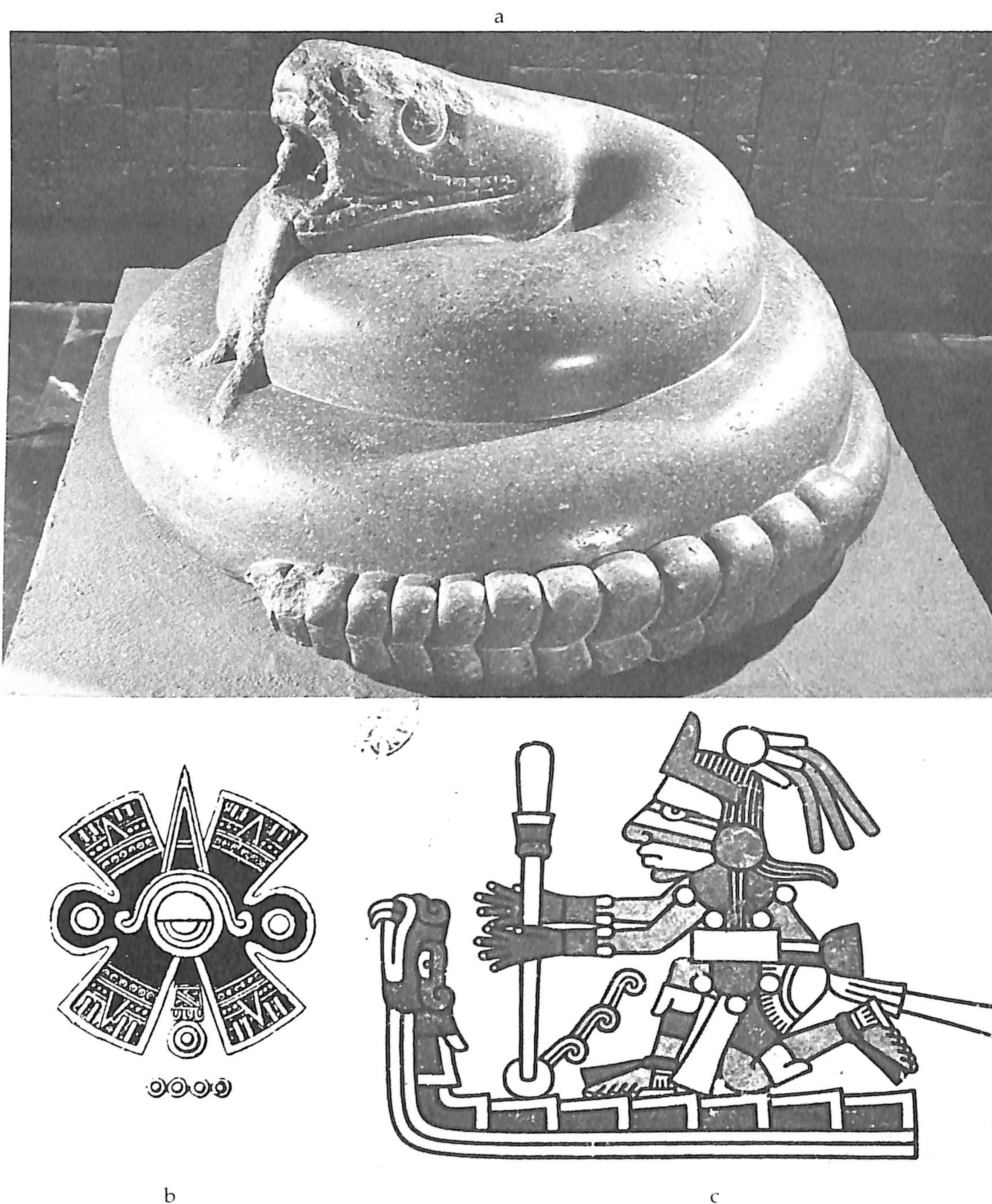


Fig. 24. Ophidian symbolism in the religious art of the Aztecs of Mexico: *a*, stone sculpture signifies the fundamental calendrical time segment of thirteen days by emphasizing the supralabial scales and rattle segments of a rattlesnake; *b*, the calendrical sign *olin nahui* carved in wood; *c*, rekindling of fire over the body of the fire-serpent Xiuhcoatl to inaugurate a new fifty-two year cycle of time, the major division of the Mesoamerican religious calendar, as depicted in the Codex Laud 8. Note the emphasis of the supraocular (eyebrow) scale symbol in the central part of the *olin nahui* sign and over the eye of Xiuhcoatl.

establish that they represent four genera—*Crotalus, Bothrops, Ancistrodon,* and *Sistrurus*—because, in most of them, generic differences in the shape of the head, dentition, width of rattle and button, and other traits, are almost accurately reproduced. Thus effigies of *C. triseriatus* were originally painted the conventional color of, and are consistently identifiable as, Xiuhcoatl, the mythical serpent that provided new fires at the commencement of each fifty-two-year era (fig. 24*c*). Furthermore, groups of effigies reflect an absorbing concern with calendrical time segments. Counts by Marquina, and especially Palacios,[53] show that originally fifty-two large sculptures of undulating serpents occurred on the eastern and northern platforms around the pyramid. A profusion of small ornamental hooks shaped like serpent heads also occur on the eastern slope in clear-cut series of thirteen. The number of such hooks embedded in the four slopes is 624, a total that corresponds exactly to the number of years assigned to one of the "Ages" or "Suns" in the cosmogony of the Mexica (the version recorded in the sourcebook, "*Historia de los Mexicanos por sus Pinturas*"). Portals, walls, and embankments dominated by paintings or sculptures of serpents, and known by the distinctive term *coatepantli* or its equivalent, meaning "serpent wall" in the various dialects, bordered important edifices of the diverse pre-Columbian cultures. Almost everywhere in Mesoamerica, this architectural feature proclaimed the eminence of the rattlesnake as a divine symbol as unmistakably as at Tenayuca.

This circumstance, however, is not always apparent in Mesoamerican sacred art unless one scrutinizes its highly stylized forms. The two objects in figure 25, called palmate stones, are typically elongated stone carvings with fan-like surfaces and rather flat—that is, they have broad and narrow sides. Palmate stones were associated with the sacred ballgame that was part of agricultural and other calendrical events among the Totonac of central Veracruz, Mexico. The rain god Tajín is featured in both. In specimen *a*, interlacing bands and volutes representing the Totonac equivalent of the Aztec *ehecacoamixtli*, the mythical serpent identified with clouds and wind currents, rise upward to crenellations that symbolize mountains and continue downward along the narrow front and rear surfaces (not visible in the figure) as globular motifs that signify storm and rain. A glyph called "serpent's eye" by Mesoamericanists occurs on the lower half of both of the broad surfaces of this stone but is in each case obscured by the ornate carving around the glyph. In addition, there is a human face carved on the narrow front and rear sides. The pluvial and ophidian connotations of the stone, however, can only be inferred from records of Totonac beliefs, as described in post conquest chronicles, and comparisons with religious objects of the Totonac culture of the sixth to ninth centuries A.D., including other palmate stones.

The palmate stone in figure 25*b* is viewed in three-quarter profile. Here Tajín is an anthropomorph, seen swooping downward with a serpent clutched in each hand. Low-relief carvings of bifid processes adorn the upper level and presumably convey the same sentiments as those expressed cryptically in *a*. That human being and serpent in *b* are but different manifestations of one and the same deity is apparent from yet another palmate stone (not illustrated here) in which, again, Tajín is portrayed twice: first in the round, as a serpent-headed human bearing a serpent staff, and again in low relief, as a human face from whose mouth hangs a long bifid tongue.[54] And again, in a remarkably large



a b

Fig. 25. Carved votive palmate stones, Totonac culture, sixth to ninth centuries A.D., central Veracruz, Mexico. Symbols representing the ophidian and pluvial aspects of the weather god Tajín are quite obscure in specimen *a* and only partially evident in *b*. Also see figure 72*c*.

frieze (fig. 72*c*), the sculptor has poised the cloud-serpent, and especially its human alter ego, as if to suggest their descent from the sky as personifications of rain. Each of them is characterized in this frieze by the prominent, stylized supraocular scale of the rattlesnake.

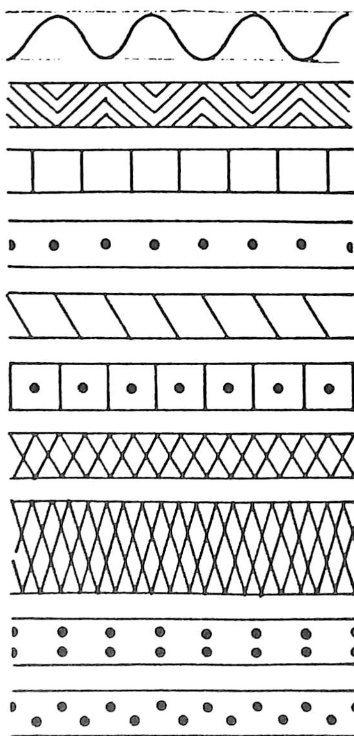
Last but not the least elusive of graphic symbols are the dorsal color and patterns of reptilian skin. Two examples should suffice: The Nuba of Sudan customarily adorn their bodies with designs that represent a large variety of animals, both dangerous and innocuous. These painted patterns have been systematically analyzed and typed by James Faris. Type 1 paintings identify an animal easily, for they depict it almost accurately. Type 2 and 3 designs, however, are purely emblematic, "precisely limited in number," and relatively esoteric. The Nuba fear poisonous serpents and frequently depict them in their personal art; Type 2 seems practically reserved for them and the python, though it also includes the less frequently represented, harmless small tortoise and pangolin (fig. 26).[55] The Luiseño of southern California painted large, elongated geometric motifs on boulders as a part of their girls' puberty rites (fig. 27). These motifs were not fertility emblems. The casual observer would hardly realize that these paintings represented the rattlesnake unless he were aware of this animal's involvement in a cult called *chungichnish*. This was "a religion of fear," the rattlesnake being "considered beyond all others [animals] the medium through which punishment falls for ceremonial offenses." It was the overseer of virtue and its bite the just punishment for transgressing tribal rules.[56]

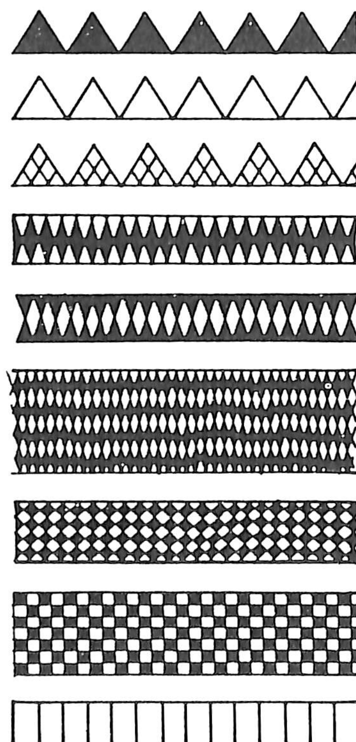
The question remains: Might the sheer simplicity of the serpent's body form and the ease of depicting it contribute to a disproportionately greater frequency of its appearance in the archaeological record than is merited by the actual significance of this animal? More importantly, is this significance diminished when other species are represented simultaneously in greater numbers? Art provides many important clues, but it would be folly to rely unduly on the criterion of frequencies without reference to other factors, as the following three cases show:

1. The prehistoric cave paintings of postglacial western Europe have yielded extremely important specimens of bone incised with indubitable serpents with bifid tongues. Many of them seem to be cultic, for they carry symbols, presumably of the phases of the moon or of human genitalia, or other signs that suggest a concern about time, or human fertility, in a manner unknown in other animal representations. In the Palaeolithic cave art of Rouffignac (southern France), out of 140 painted or incised representations of six species of animals, mammoths predominate handily, being 61 to 100 percent of the animals depicted in the various parts of the cave, and are followed by bison, stags, ibexes, and horses in varying frequencies. Serpents are rare but not unrepresented. They occur paired or in the company of an anthropomorphic figure on the "Great Red Dome," also known as "Serpent's Dome."[57] Western European cave art, however, is not particularly notable for paintings of serpents, though a very few examples are known from southern France, Spain, and elsewhere.[58] Therefore, the evident tendency to portray large numbers of artistically more complex animal forms—horses, mammoths, bison, and deer—that convey no distinctive cultic sentiment seems, in this respect, fortuitous, or at least no less so than portrayals of the serpent.

2. The burial sites of the Hopewellian culture complex, formerly wide-




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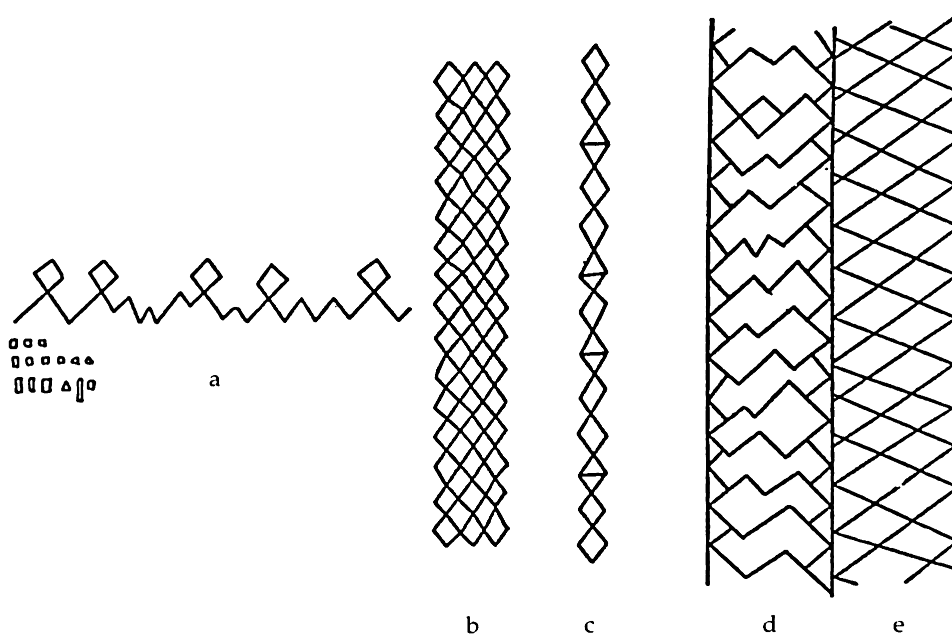


Fig. 27. Designs denoting the rattlesnake, painted on rocky outcrops by young Diegueño girls during *wegenish* (Luiseño, *chungichnish*) rites, California, U.S.A. *d* and *e* almost certainly represent the ventral and dorsal surfaces, respectively, probably of the western diamondback, *Crotalus atrox*.

spread in North America, are remarkable for their raised earthworks and the uniform characteristics of their grave goods. The pottery and smoking pipes bear effigies of nearly every major mammal and bird of the Great Lakes region and the Ohio Valley. For a people who lived off the major migratory flyway, especially in south-central Ohio, the duck—there is no evidence that it was a cult species—seems to have received far more than its fair share of attention as compared with, for example, the wolf or the bear. Serpent effigies are not particularly common, but this fact will mislead no one who is acquainted with the myths of North American aborigines as a whole, in which the rattlesnake is accorded outstanding rank, and not merely because the largest and best-known of Hopewellian relics is the Serpent Mound. This is an immense raised earthwork in the form of a sinuous serpent 410 meters long, 1.52 meters high, and 9.12 meters wide. It is represented with fully open jaws, 23 meters wide, enclosing what appears to be a rounded configuration symbolizing an astral body.[59]

3. The overt features of paintings by Bushmen in archaic rock-shelters of the Drakensberg region of South Africa, intensively analyzed by Patricia Vinnicombe,[60] do not reveal the full story. The animals portrayed belong to a fauna that almost certainly has suffered no major compositional changes from the period of the "Later Stone Age" (radiocarbon-dated over a widespread local area

Fig. 26. Nuba man with ornamental facial and body paint depicting *dēna kwā*, a poisonous serpent, and linear representational symbols, all of Faris's Type 2: *a–h*, poisonous serpents; *i* and *j*, python; *p* and *q*, pangolin; *r*, small tortoise; *k*, mountains; *l*, female breasts; *m*, *n*, and *o*, cowrie shells; *s*, rain.

to earlier than 20,000 B.C.) to the recent (Phase 4) period in which traditional Bushman cultural expressions have been affected by European encroachment on their hunting grounds. The range of animal species represented in recent works, even post–A.D. 1680, is much the same as that found in quite early, excavated paintings. The bulk of these are from the Later Stone Age, if not earlier, and are a comment on the conservatism of Bushman art and on the continuity in the Bushmen's hunting mode of life. The paintings, according to Vinnicombe, are neither a menu nor a mere checklist, but have complicated mythological or other significances rooted in the tribal world view and, occasionally, the availability of such materials as hematite, which is conventionally used as a color for one or another species, regardless of authenticity. The rock rabbit, a prolific very easily hunted species important in the Bushman diet, is not at all represented in the paintings anywhere in the area surveyed, and jackals, despite the prominence of their packs, are represented only twice. The frequency distribution of these paintings of various wild animals in 150 recorded rock-shelters is shown in figure 28.

Antelope of all kinds are the most frequently depicted of the Drakensberg regional art forms and constitute 77 percent of the total. The eland alone constitutes 35 percent, is the principal focus of interest because of its important religious and mythic roles, and is often drawn painstakingly. The much more easily depicted serpent constitutes a mere 1 percent, but this numerical deficiency is fortuitous, for the animal's actual importance is as great as the eland's. What is remarkable is that the serpent representations are "exaggerated out of all proportion to the other subjects [including eland] with which they are associated." If the correct proportions were maintained, one of the mythical serpents would be 30 meters long as compared with the human figure holding its tail, writes Vinnicombe.[61] In addition, she stresses the clearly important associations of eland and serpent in these paintings, the very frequent involvement of both

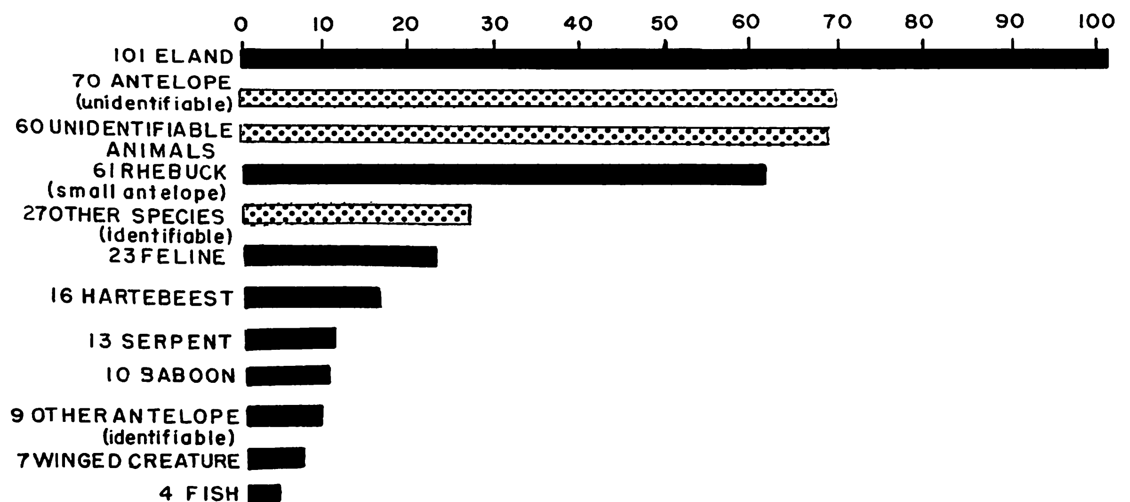


Fig. 28. Frequency distribution of various classes of wild animals represented in paintings at 150 Bushman rock shelter sites, Drakensberg region, South Africa. "Other species" combines various identifiable but numerically insignificant representations of the elephant, rhinoceros, hippopotamus, antbear, hare, mongoose, and several others.

animals in present-day Bushman traditions, and the special role of serpents in rainmaking rites, myths of terror, cosmological beliefs, and the preparation of poisoned arrows. "A special snake lives between the horns of all eland, and before eland meat can be consumed, it has to be 'purified' of the venomous juices it contains."[62]

The usefulness of the clues from ancient relics is clear from this brief general survey. The need to avoid conclusions based on frequencies of artistic motifs alone is equally clear, as is the handicap imposed by their increasing rarity the farther back one goes in time. Moreover, the essentially conservative nature of Bushman tribal life exemplifies how, despite the relative paucity of serpent motifs in their rock-shelters, animal traditions sometimes impinge on art in covert forms that lie beyond the purview of the art historian. At the base not only of Bushman traditions, but also of those of all other societies have lain emotions which throughout man's social evolution have impelled him to think of, or portray, an emblematic animal—any animal—for a special reason. For the vast majority of animals, whether dangerous, innocuous, or very familiar to him, it is hard to pinpoint an attention-evoking stimulus that transcends fickle cultural predilections. They are, in Lévi-Strauss's eminently useful words, simply *bons à penser,* "good for thinking."

By contrast, in a most fundamental way, the serpent's hold on human imagination owes far less to its being good to think about than to the intrinsic qualities—mere form of the body and undulant locomotion—which are its unique instruments of fascination. And ultimately it is its capacity to fascinate, to terrify and "lay under a spell," to hold "mute and frozen," that prompts man to adopt it as a symbol. But graphic symbols and symbolical concepts vary. Even the most tangible attributes of an animal may fail to impress a society or, as potential emblems, impress different societies differently. Symbols are highly idiosyncratic in origin, subject to social approval, learned, and mystical even to their users and may in time be modified or discarded. The history of Hindu, Egyptian, and Mesoamerican religious art reveals this amply.

No universal symbol or category of symbols can be devised instinctively, for, unlike instinctive patterns of aversive behavior, there is among primates no such thing as "unconscious" or instinctive *thought.*[63] This circumstance offers little encouragement to those who seek, in humans, the constituent elements of a cross-cultural universal "logic" underlying all symbolism. On the other hand, certain elementary *emotions* originate and are nurtured independently of thought and "logic," are aroused primarily by innate genetical and physiological mechanisms, and hence have the potential of giving rise to human attitudes that prevail cross-culturally. Furthermore, certain specific fears exist which are latent in an individual and affect these emotion-rousing mechanisms under circumscribed conditions.

Ophidiophobia—readers must remember that I use this word in a broad, nonpsychiatric context unless indicated otherwise—clearly belongs to this category, for it is liable to be unmasked by ecological factors and perpetuated by cultural biases that seem to have taken shape primordially during man's organic and social evolution. The wider implications have scarcely been explored by cultural and psychological anthropologists. The fear and emotion manifest in the cult of the serpent, therefore, cannot be appreciated without reference to the environmental and physiological facets of sensitivity to this animal.

CHAPTER 2

The Suborder Serpentes: Its Veneration and Calumniation

FACTORS THAT AROUSE AWE

Certain distinctive features of ophidian behavior seem to have generated, almost universally, a vast variety of superstitions and myths. For example, the natural tendency of serpents to emerge from flooded lairs towards the dryness of higher ground or human habitations, the sun's intensity and direction as factors affecting their seasonal activity or accuracy of aim when they strike—and the burning pain and death that may ensue—are a few of the reasons man gives them symbolic roles in pluvial and solar myths. Their lunar associations are but a corollary, for there are numerous nocturnally active species. Peculiarities of ophidian reproductive behavior are apt to suggest analogies with human sexuality. Agricultural bounty may be linked with seasonal dangers posed by serpents inhabiting the cultivated field. Associations like these are explicit in the traditions of quite unrelated cultures and have impelled man to attribute ophidian qualities to deities who preside over mundane events that concern him deeply. Even when the serpent is harmless, its unpredictable, stealthy manner exacer-

bates the initial shock of viewing it at close quarters, thus prompting an awe of the entire ophidian family. On the other hand, shrewd possessors of knowledge of its behavioral traits often handle deadly poisonous species with impunity, impressively filling the roles of shaman, priest, or entertainer.

Human sensitivity to the serpent is ultimately grounded in the combination of its physical characteristics and its venom. The importance of venom is clear from a comparison with lizards, reptiles that closely resemble the serpent in body form, internal anatomy, skin texture, coloration, and sinusoidal, creeping locomotion. The total numbers of nonfossil species in the suborders Serpentes and Sauria are quite comparable—approximately three thousand in each—but there are about seven hundred species of venomous serpents as against only two species of venomous lizards, both of the genus *Heloderma*, the so-called Gila monster. The range of this lizard is extensive, from Utah in the southwestern U.S.A. to the Isthmus of Tehuantepec in Mexico. The rattlesnake is its only rival for the serious attention of aborigines, whose lizard lore it totally obscures. The archetype of the important Post classic Maya god Itzam Na is thought to be a large harmless lizard, the iguana (or cayman?)—its real identity is obscured by etymology and florid art. Nonetheless, one of his epithets, Tzab (rattlesnake rattles), certain distinctly ophidian features in some of his sculptural representations, and his associations with rain, sun, and bountiful harvests[1] carry clear hints of his ophidian ancestry (fig. 16).

It is doubtful that any species of animal potentially dangerous to man, other than certain arachnids, has ever surpassed the serpent in frequency of close encounters that often end in violence, usually to man. This is a consequence of the sheer abundance of reptiles in the tropics and, seasonally, in the temperate regions and their occupation of ecological niches unavailable to most large beasts of prey usually regarded as dangerous. Members of species like the bear and the wolf, which once were very widely distributed, and the more range-restricted felids, such as leopards, tigers, and lions, need far more living room, have always had much thinner populations in the available space, and generally do not invade human habitations or cultivated land as frequently as serpents. Indigenous species of "dangerous" mammals and, in a few zones only, the venomous scorpion, spider, and centipede seem to be the principal rivals for man's attention, but of these only the scorpion has been deified (or symbolized a deity) importantly, perhaps only in ancient Egypt and Mesopotamia. The venomous honey bee was venerated, only rarely as in ancient Crete, Greece, and perhaps Neolithic southern Spain.

To understand why reptiles have alternately been venerated and calumniated from time immemorial, it is important at the outset to be mindful of their geographic distribution. No cult animal except the bird is as widely distributed as the serpent, which extends as far north as the Arctic Circle and as far south as the tips of the continents, though there is a sharp seasonal ebb in its activities as well as a drop in populations at these extremes. Faunal compositions vary drastically with climatic and geographic factors, but between sixty-eight degrees north latitude and forty-eight degrees south latitude there are few places inhabited by man in which venomous serpents cannot be found.[2] The hardy viviparous European viper *Vipera berus* crosses the Arctic Circle in Sweden, and this or related species come within a degree or two of this zone in parts of Siberia. The southern limit is attained by the pit viper *Trimeresurus ammodytoides* in Santa Cruz

province, Argentina. The altitudinal limit of about 3,048 meters is reached, in the Swiss Alps, by the adder.

It is of course in the tropics, both humid and arid, that, because of their obtrusiveness, we may expect to find the strongest sentiments about serpents. The temperate zones, however, are no less impressive in this respect. Places like Ireland and Iceland, in which both venomous and nonvenomous species are entirely lacking, are exceptional—but noteworthy for their pre-Christian ophidian traditions.

In many places, usually islands, terrestrial venomous species are either absent or scarce and very rarely a cause of death. Among the most notable in this category are Madagascar, New Zealand, the West Indies (except Trinidad, Tobago, and St. Lucia), the Philippines, Vancouver Island off British Columbia, Eastern Samoa, and the Pacific islands from one to twenty degrees north latitude and from one hundred thirty to one hundred seventy degrees east longitude.

The marine species are all extremely venomous. Encouraged by the fairly constant temperature of tropical latitudes, they are very widely distributed in great expanses of the warm seas. The broad continental shelves of northern Australia and Southeast Asia, the Bay of Bengal, the Philippine region, the Arabian Sea coasts of western India and Pakistan, the Persian Gulf, and the West Coast of Middle America all have dense populations of sea snakes. These also occur in lagoons, reefs, and rocky inlets of the sea and are a potential threat to fishermen, whose nets catch them in large numbers and who generally sort them out by hand. Estimates of deaths due to their bites vary, but a survey report on a few fishing villages in northwestern Malaya estimates the annual number of deaths from sea-snake bites at 150. Fishermen admit a fear of these bites "more than of anything else." There is a strong superstition among Malay fishermen that talk about sea-snake bites offends the reptiles and changes their timidity to aggression and that if a victim talks about his experience he will be bitten again.[3] Death by sea-snake bite is an occupational hazard for pearl divers in the Persian Gulf. In most cases mortality statistics are unavailable, insufficient, or unsystematically kept.

The World Health Organization's very extensive survey[4] of snakebite mortality due to terrestrial species reveals considerable variation worldwide even in those regions which have large reptilian populations. Deaths due to various causes are not adequately registered in many countries, particularly the undeveloped ones, where snakebite mortalities are certainly higher than is disclosed by the official figures. Still, as a rough index both of modern mortality rates and the ecological severity of an ageless problem, the WHO statistical survey is a very extensive, useful compendium.

The total population of the countries that possessed national systems for the collection of vital statistics and snakebite mortality data comparable to the population exposed to this risk (i.e., rural populations only) at the time of the WHO survey was 1,122 million. On the basis of this figure, calculated mostly from pre-1950 statistics, the annual number of deaths from snakebite in the world (excluding China, the U.S.S.R., and Central European countries) was estimated at thirty to forty thousand. The highest figures were for Asia (twenty-five to thirty-five thousand), followed by South America (three to four thousand). North America (including Mexico), Europe, and Oceania record relatively low figures—three to five hundred, fifty, and ten respectively. No reliable figures are

available for Africa as a whole, though a few countries do keep useful records. Considering the large numbers of cases of snakebites and deaths that may go unreported in the remoter districts of many Asian countries, Africa, Mexico, and Central and South America, one can only hazard an educated guess at the world total of snakebite cases, venomous and nonvenomous. The WHO survey puts the figure at about half a million annually.

Human attitudes are no less strongly molded by the shock of a close brush with, if not a bite from, a harmless species or, worse, a venomous one that has delivered a painful if sublethal dose of poison. These experiences, however, are more powerfully reflected in ethnological and religious literature than in statistical treatments of mortality rates. I shall omit nonessential details and digress only minimally to relate the data to local religious traditions and then proceed to a separate treatment of these traditions as expressed in ethnically explicit sentiments of fear and emotional stress.

The WHO survey report includes a useful map of the Indian subcontinent indicating the distribution of fairly reliable five-year average snakebite mortality rates, ranging from 0 to 36.8 deaths per 100,000 population per year in the region embracing Bangladesh, Burma, India, Pakistan, and Sri Lanka but demarcated according to political subdivisions now obsolete. The variations from locality to locality are obvious in this example, but the chief value of the information is its relationship to a general situation prevalent during a concomitant period of sampling. Table 1 summarizes the fatality rate per hundred bites among 376 cases of snakebite from a five-year record of cases that received medical treatment in accordance with firm knowledge of the species involved (cobra, krait, viper, etc.) or symptoms (or lack of them) as diagnosed by a medical officer. The figures were compiled from all over India, the total of 376 representing cases registered in *consecutive* order, and hence may be considered relatively unbiased despite the normal provincial variations in mortality rates. The low fatality rate of 17.9 percent, however, is a misleading one, as many more deaths would surely have ensued if the 151 patients represented in the envenomated category had not received antivenin treatment within thirty minutes to forty-eight hours after being bitten. The most important information, however, is that the ratio of bites is approximately 40 percent venomous to 60 percent nonvenomous in an average year. These figures are disproportionate, since, in nature, individuals of venomous species are far less common than nonvenomous ones. This is borne out by the greater number of patients (225 out of 376) seeking treatment for bites despite the absence of any symptoms of toxicity, which is a comment on the victim's inability, for whatever reason, to identify the attacker—and this in a country in which snakebites in general are much less frequent in rural surroundings than the opportunity of learning to recognize the few venomous species through chance observation from a safe distance.

To summarize a mass of fairly reliable data from the various states of India: There was an average of 13,291 known deaths from snakebites per year between 1940 and 1949. The average annual death rate due to snakebite was 4.6 (range 0.6–9.1) per 100,000 population, very largely rural, between 1941 and 1945. Deaths from snakebite as a percentage of deaths due to *all* other causes in 1948 averaged 0.25% (range 0.06%–0.51%). The highest frequencies of venomous bites and deaths are reported between May and October, the lowest between December and March—circumstances that are not only related to changes in

TABLE 1. FATALITIES AMONG SNAKEBITE VICTIMS RECEIVING ANTIVENIN, 376 CASES, INDIA (1948–52)

SPECIES	NO. OF PERSONS BITTEN	DEATHS	FATALITY RATE (%)
Colubrine			
Cobra	42	2	4.8
Krait	9	8	88.9
Unknown	36	10	27.8
Total	87	20	23.0
Viperine			
Russell's viper	12	1	8.3
Echis	11	4	36.4
Unknown	41	2	4.9
Total	64	7	10.9
Nonpoisonous bites	225	—	—
Poisonous bites	151	27	17.9
All species	376	27	7.2

SOURCE: Swaroop and Grab, "Snakebite Mortality," table vi.

reptilian temperament and behavior during the breeding season and the natural aggressiveness of young cobras, but also coincide with the timing of important cobra-worshipping festivals. The highest snakebite mortality rate, 14.2 per 100,000 persons, occurs in the Rajshahi district, on the lower Ganga River, Bangladesh, the archaeological heritage of whose formerly large Hindu population is but a part of the subcontinent's traditions. Strongly rooted in aboriginal religion, ophidian divinities and semidivinities are legion in Hinduism. One of these is Manasā, also known by epithets meaning "mother of serpents" and "healer of poisonous bites" (fig. 29). The propitiatory fervor that she, other serpent deities, and even live cobras incite in village festivals is amply documented.[5]

Burma easily surpasses both India and Bangladesh in mortality rates. Of a total of thirty districts, fifteen have annual death rates due to snakebite as high as 15 per 100,000 population, as compared with 9.1, the highest on record in India. The average is 15.4 deaths per 100,000, but at least five Burmese provinces have annual death rates of over 28, the highest reached being 36.8 per 100,000—perhaps a world record. It is no coincidence that the supernatural *nats*, the harmful or potentially harmful spirits that loom so prominently in Burmese animistic thought and custom, are linked with serpents. The *nat* of the moist paddy field is a female spirit called Tabindain Thakinma who sends serpents and skin disease as punishments if she is not propitiated at rice transplantation time. Another female *nat*, Nedoshin, is petitioned for protection against serpents of the dry fields.[6]

In most southern and western Asian countries, the mortality rates approximate those of India, with wide variations within each country depending on the topographic conditions. The details for each country need not be enumerated, but the statistics from Israel and Japan are of some interest. The pursuit of a program of snake-venom research almost from the beginning of Israel as a modern state is a comment on the concern about snakebites in the region. In the two-year periods of 1951–53 and 1955–57, 721 cases of bites were reported, with a total of 41 deaths registered.[7] In Japan, despite its denser human and thinner



Fig. 29. The Hindu goddess Manasā, holding her emblem, the cobra, twelfth century A.D., Pala Dynasty, eastern India. Seven fused cobra hoods form an aureole, a cobra serves as her brassiere, and two cobras emerge from the *kalaśa*, normally a sacred water vessel that symbolizes prosperity.

reptilian populations, the number of deaths from *mamushi*, the common adder *Agkistrodon blomhoffii*, was an average of 109 per year during 1947–50. The highest incidence was in Shimane Prefecture, 0.68 per 100,000 population, the average for the entire nation being 0.13[8]

The ophidian traditions of Hebraic and other ancient Near Eastern religions need not concern us at this juncture, but a comment on those of prehistoric Japan is in order in view of the low frequency of snakebite cases in that country.

The importance attached to ceremonial pottery in modern Japan is clearly traceable to the agricultural societies of at least the Jomon period, whose earliest ceramic phases stretch back to the eleventh millennium B.C.[9] So striking are the ophidian motifs on ritual clay vessels and idols that the Japanese authority Esaka Teruya believes that "it may not be too much to suggest that *all* Middle Jomon decoration is snake-derived," since the zoomorphic repertory focuses on the serpent and, to a much lesser extent, on deer, frogs, flowers, and a solitary dragonfly.[10] In Japanese mythology, pottery is the abode of the serpent and the fire and lightning gods. Pottery symbolized the sun and was ritually buried in agricultural fertility rites. One myth relates how the sun (or heaven) deity was transformed into a serpent, a transformation exemplified today by the Shinto shrines at Ise, where the sun goddess Amaterasu is venerated in her serpent aspect.[11]

Australia, one of the most important regions for the study of the serpent cult among aborigines, is the home of several species described as "outstanding for their abundance, insolence, and high toxicity." The tiger snake *Notechis scutatus* is one of the most aggressive of these. Its extremely toxic venom is said to be responsible for a high proportion of deaths among Aborigines in the "outback," but the fatality rate is unknown.

European figures, not unexpectedly, in general are much lower than those for tropical countries. The only venomous species found in Europe are the true vipers of the genus *Vipera.* Also known as the adder, *V. berus* ranges from the Balkans, Apennines, and Pyrenees northward to sixty-eight degrees north latitude in Scandinavia and across northern Asia to Sakhalin. *V. aspis,* considered to be aggressive and responsible for many accidents, is common in southern France; it also occurs in the Pyrenees, southern Italy, and Sicily. The severely venomous *V. ammodytes* (and subspecies) is known in Austria and the Balkan countries, Greece, and European Turkey. *V. lebetina* occurs on the Cycladic island of Delos and in Cyprus. Lataste's viper *(V. latasti),* found in Spain and Portugal, is considered a less dangerous species, for its bite is less often fatal. The available death rates from Europe are generally for bites of venomous animals, though the overwhelming majority of these are due to snakebite. The data up to 1950 are summarized in table 2.

It is clear that snakebites are rather infrequent in the rural areas of Europe, especially the far northern ones. Swedish Public Health Service statistics (1915–44) indicate that about 1,300 persons were bittern annually by *Vipera berus,* with only 1 person being hospitalized for every 8.5 bitten. Higher mortality was recorded among children. Danish National Health Service figures for 1900–47 reveal that approximately 1,200 were bitten, of whom only 15 died. All these deaths were among children between the ages of 1 and 12. For Switzerland, it is estimated on the basis of 25 deaths recorded during a fifty-year period that 5 to 10 persons were bitten annually by vipers. In the summer of 1961 alone, 163 snakebites were registered among agricultural workers in Finland.[12] The Finnish death rate is almost the same as the Spanish, English, and Welsh. The figures for France and Italy are the highest in Europe but are only a tenth of the lowest regional figure from India.

The mortality figures from Europe (and even the details omitted) are a rough but useful index of snakebites as an environmental hazard. The factors that prevent strict comparisons are many and variable from region to region. Our perspective, however, is historical, and one hardly need scrutinize the

TABLE 2. AVERAGE ANNUAL DEATHS FROM VENOMOUS ANIMALS IN VARIOUS EUROPEAN COUNTRIES

COUNTRY	PERIOD	AVERAGE ANNUAL DEATHS	DEATH RATE PER 100,000 POPULATION
Spain	1946–48	5.3	0.02
Finland	1946–50	1.2	0.03
France	1944–47	21.5	0.05
Ireland	1943–49	—	—
Italy	1944–48	17.6	0.04
Norway	1946–50	0.4	0.01
Netherlands	1946–50	0.4	0.004
England and Wales	1945–49	8.0	0.02
Scotland	1946–50	0.2	0.004
Sweden	1946–50	0.4	0.006

SOURCE: Swaroop and Grab, "Snakebite Mortality," table vii.

figures more deeply to recognize that mortality *rates* must surely have been higher in the pre-antivenin era and, more significantly, that the *risk* of a bite—fatal or not—has always been about the same in any given locality throughout human history.

The importance of the serpent in far northern European mythologies, however, is quite out of proportion to the actual rarity of serpents and infrequency of their attacks. This warrants special comment in view of the impressive archaeological relics of the Stone Age and later times from a wide area bordering the Arctic Circle around the Lake Onega, the White Sea, and in Scandinavia. Many of the elk-antler or bone objects found at the Olenii Ostrov burial site, U.S.S.R., only about 400 kilometers south of the Arctic Circle, are obviously ophidian (fig. 30*a*, *b*). The significance of the ornamentation of others, such as the elk-antler axe handle from Narva, on the northern coast of Estonia (fig. 30*e*), is less obvious but consistent with the involvement of the serpent in the mythology of an area, including Scandinavia in particular, in which the cultic significance of hafted axes is well established. Still other objects (fig. 30*d*), found in the peat bogs of Gorbunovsk, in the northern Urals, are partially anthropomorphic but suggestively ophidian because of the clear-cut serpent models also found in those bogs (fig 30*c*). Palaeolithic far-northern European rock engravings and stone objects generally portray economically useful animals such as the elk and bear, an art probably prompted by the magic connected with the hunt among cultures of about 2000 B.C. and, surely, earlier. The nomadic Lapps (Same) of subarctic and arctic Finland, Norway, and Sweden retain much the same attitudes towards animals as have prevailed in the region since the earliest times. An object of focal interest in Lappish rituals is the shaman's drum, the earliest extant specimens of which date from about A.D. 1500. The paintings on the skins of these drums portray a variety of animals including (as in Palaeolithic rock art) the serpent, in addition to the frog—animals which could only have had magical significance in prehistoric times. Pre-Christian ophidian traditions that survive in modern rural Swedish and other northern European domestic customs are well documented.[13]

The fauna of Ireland totally lacks serpents, yet the latter are depicted, alongside solar symbols, in the rupestral carvings of passage-graves of the fourth

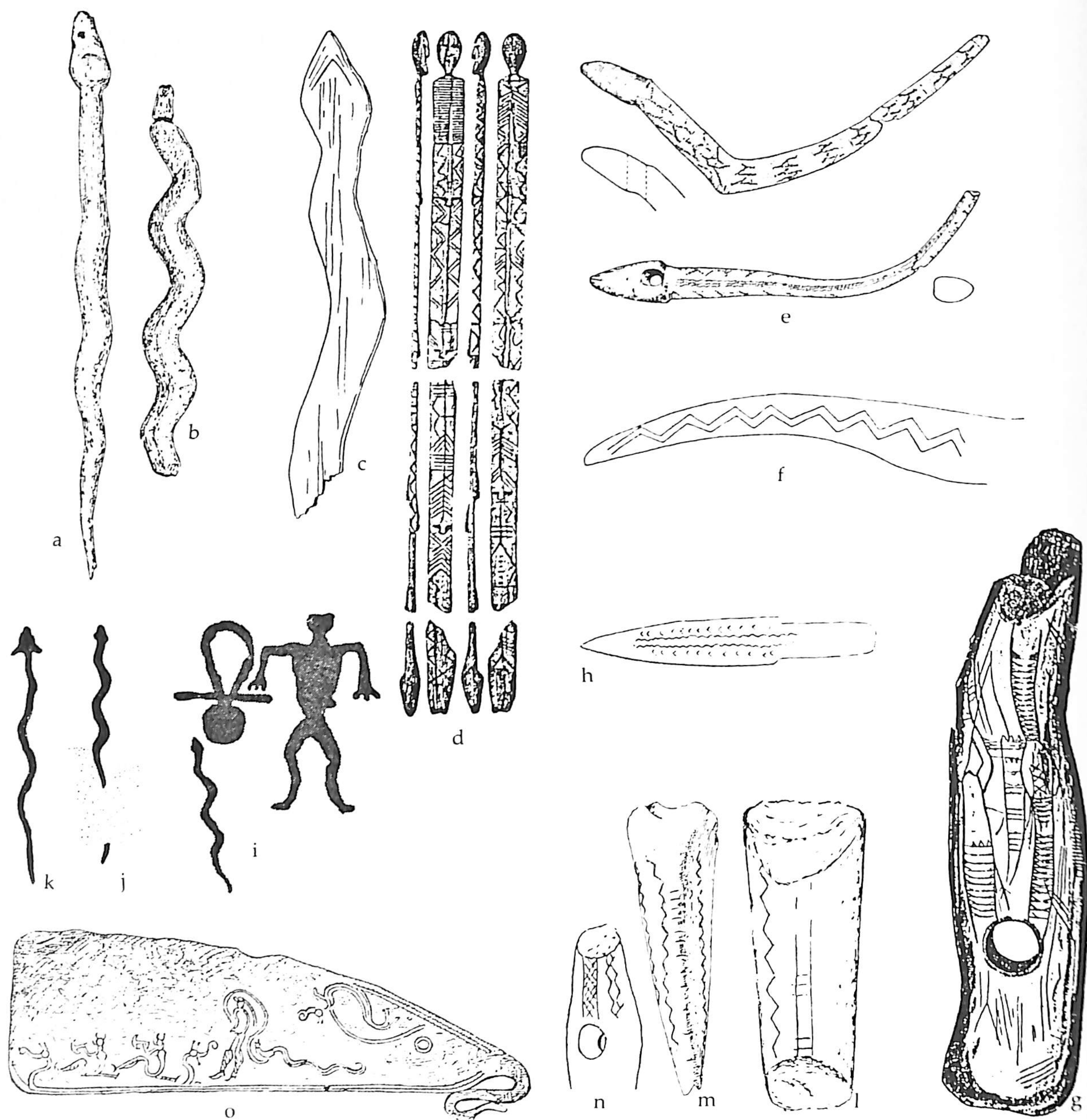


Fig. 30. Far Northern European relics: *a* and *b*, naturalistic serpents in bone or antler, Neolithic, second millennium B.C. Olenii Ostrov, Lake Onega, U.S.S.R.; *c* and *d*, naturalistic and human-ophidian (?) images, Gorbunovsk peat bogs (third millennium B.C.?), northern Urals, U.S.S.R.; *e*, elk-antler axe handle in the form of a serpent, with zigzag and scalelike incisions, Palaeolithic, Narva, northern Estonia; *f*, bone spear from the L'uban swamps, U.S.S.R.; *g*, deer-antler axe, Mesolithic, 10–8000 to 7–4000 B.C., Scania, northern Sweden; *h*, bone spearhead, Neolithic, Kunda, Estonia; *i*, *j*, and *k*, Palaeolithic rupestral engravings from the Vyg (White Sea), Karelia (Finland), and Lake Onega regions, U.S.S.R.; *l*, *m*, and *n*, elk-antler axes, Bohuslän, northern Sweden; *o*, bronze votive razor with inlaid iron decoration, including a female divinity leading a serpent on a leash, Chalcolithic, Vestrup, Denmark.



Fig. 31. The Celtic antler-headed god Cernunnos holding his sacred attributes, the torc and the ram-headed serpent, with his other sacred symbol, the stag, nearby. Decoration on the Gundestrup cauldron, Celtic Iron Age, North Jutland, Denmark.

millennium B.C. and antedate by at least two and a half millennia the very extensive repertory of fantastic serpents of pre-Christian Irish (and Welsh) mythology and iconography. These much later traditions stem from migrations from central Europe of a people, the Celts, who venerated serpents and gave them a prominent place in their bestiary. The most important attributes of their major god Cernunnos were the stag and a ram-headed serpent (fig. 31). Despite this, Irish, Welsh, and continental Celtic myths are replete with gory tales of heroes burning or slaying dreadful water-dwelling serpents.[14] The symbolism of modern British folklore on serpents (or dragons) hardly reflects Christian attitudes toward heathenism, Satan, and moral evil. Jacqueline Simpson's analysis of fifty tales for their pre-Christian elements reveals that only three ignore human relationships with serpents. While the theme of attacking or slaying them is lacking in these, in forty-seven other tales fantastic reptiles are explicitly characterized as destroyers of men and animals, as venomous and/or fire-breathing, water-dwelling creatures.[15]

The abhorrence of venomous creatures in general is epitomized in a medieval Northern European prayer attributed to the Apostle John:[16]

> My God and Father our Lord Jesus Christ, through whose word Heaven has been fortified, who reigns over everything and whose might is feared by every creature, therefore we call upon thee for help in order that, upon hearing thy Name, the serpent should lie still, the dragon take flight, the viper be silent, the scorpion be annihilated, the toad called the frog repose benumbed, the basilisk be conquered, the venomous spider cause no harm [and] in the end, that all venomous creatures, and even more, all wild reptiles be pierced through. Thus I beseech thee, destroy this venom, destroy their death-dealing ways, remove their strength. And give them eyes to see, ears to hear, and the hearts to comprehend thy might.

TABLE 3. DEATHS FROM ATTACKS BY VENOMOUS SPECIES OF ANIMALS IN ARIZONA

CAUSE OF DEATH	PERIOD 1929–36	1938–45	1946–48	TOTAL	PERCENTAGE
Snakebite (rattlesnake) .	8	6	1	15	16.30
Scorpion stings	30	30	4	64	69.56
Spider and insect stings.	6	5	2	13	14.13
Total	44	41	7	92	(99.99)

SOURCE: Swaroop and Grab, "Snakebite Mortality," p. 46, with percentages added.

Why are *reptiles* calumniated preferentially in a prayer that also mentions animals like the scorpion and spider, even though, in Biblical mythology, the archetypal devil is never incarnate in the latter two? Are these invertebrates any less dangerous?

A comparison of the depredations of scorpions, spiders (all species of which are poisonous to some degree), and rattlesnakes where these three occupy a common habitat is of much interest from a cultic viewpoint. In the state of Arizona, whose rural population in 1930 was 860,000 the number of deaths resulting from the attacks of these animals is shown in table 3.

A figure of 0.93 snakebite deaths per 100,000 population per year in Arizona (for the period 1929–36) may not seem impressive, though these deaths did occur in a society with far better access to personal protection through first-aid, antivenin treatment, and transportation than is available in many other countries. However, it is roughly comparable with the fatality rate in Assam, India, where the figure (for 1941–45) was 0.6 per 100,000 per year. What is far more relevant about the Arizona figures is that they disclose a considerably higher proportion—more than four to one—of deaths from scorpion stings than from rattlesnake bites. Indeed, the toll taken by the rattlesnake is not any more impressive than that taken by spiders and insects.

This situation is paralleled even more strikingly in Mexico, among whose rural population, which in 1940 was no more than 18 million,[17] over 4,000

TABLE 4. DEATHS FROM ATTACKS OF VENOMOUS SPECIES OF ANIMALS IN MEXICO

CAUSE OF DEATH	YEAR	REGION NORTH PACIFIC	NORTH	CENTER	GULF	SOUTH PACIFIC	TOTAL	PERCENTAGE
Snakebites	1940	4	39	39	40	35	376	9.35
	1941	4	44	60	55	56		
Scorpion stings	1940	144	58	945	—	480	3,437	85.49
	1941	158	57	980	3	612		
Spider stings	1940	2	6	9	—	1	37	0.92
	1941	—	2	15	—	2		
Other stings	1940	31	12	100	1	26	170	4.22
	1941	—	—	—	—	—		
							4,020	(99.98)

SOURCE: Swaroop and Grab, "Snakebite Mortality," p. 53, table ii, with percentages added.

victims of venomous bites were officially registered in a two-year period. Presumably, the actual number of fatalities was greater, but the relative percentages in table 4 in any case are not affected by the statistical samplings. Scorpions caused more than nine times as many deaths as snakebites all over Mexico. However, the remarkable fact is that the major deities of the cultures of pre-Columbian Mexico, both primitive and civilized, include several conspicuously ophidian ones. Arachnoid (scorpion, spider, centipede) and insect deities, even minor ones, are quite obscure in Mesoamerican traditions—with one notable exception, the demonic goddess Itzpapalotl, who, however, is conceived in the form of the innocuous butterfly.

A contrasting case, bearing on the question of selective attention to animals, is provided by ancient Israel, whose scorpion lore is far less impressive than that of the viper, the "serpent of Israel." In contrast to the situation in Mexico and Arizona, this may be due to the serpent's greater reputation as a killer, for the deaths it causes outnumber those due to scorpions three to one. Scorpion species common in Israel may be less lethal, but their venom is no less painful than the viper's or cobra's and, in fact, they bite oftener, just as they do in Mexico and Arizona—the ratio being 3.28 to 1.[18]

A few general assertions may be made from the very condensed information given so far: (1) Mortality rates due to snakebites are extremely variable even in the tropics, where they are highest. (2) The frequencies of severe bites (including nonfatal ones) of all venomous animals deserve more recognition, since a great many escape systematic official registration. Still, the numbers of estimated mortalities from snakebite alone seem small in proportion to the total rural populations of these countries or to deaths from infectious disease. (3) Serpents are unquestionably a much greater menace to human life than are the carnivorous mammals. Presumably this has been so during most of the history of mankind simply because of ecological forces, the relative concentrations and distributions of the animal species in his domains, and the more insidious ways in which reptiles confront man. (4) The scorpion, by the same token, surpasses the serpent overwhelmingly as a cause of death in at least two representative regions—throughout Mexico and certain parts of the U.S.A., and possibly elsewhere—in which both species are important members of the local faunas and in which any deficiencies in the gathering of data are likely to affect the two species equally.

The fact remains that even in the tropics serpents of all types—small or gigantic, active or sluggish—have a thoroughly awesome reputation due more to their "repulsive" appearance, sinuous creeping movement, and capacity to cause panic in natural surroundings than is warranted by their actual frequency of attacks: Not more than about 212 of about 2,700 known species of the suborder Serpentes are venomous to a fatal degree and may be considered very dangerous. This minority only enhances a keen awareness of reptilian traits—whether inscrutable, real, or imaginary—and an aversion for even harmless species, many of which mimic the venomous ones in appearance and aggressive stance. Yet, not even are the bites of the most venomous species always fatal.

Many factors, such as the degree of toxicity of the venom, the amount entering the victim's bloodstream, the species, age, and size of the animal, and the resistance of the victim determine the prospects of recovery. There may be temporary allergic reactions to certain components of even the less toxic varieties

of venom. Nonvenomous species occasionally carry pathogenic microorganisms on their fangs, for example, clostridial organisms causing tetanus and gas gangrene. The very young and the old are susceptible to serious aftereffects in their extremities and in tissues in which absorption is poor. Bites near vital organs are more dangerous. Intravenous injection of the venom may result in death within minutes. The potency of the venom varies from species to species, and sometimes victims of the bites of even the deadliest of them may survive, depending on how much envenomation has actually occurred. The amount of poison injected by a very deadly species may sometimes be negligible because the attacker has recently expended its reserves for a meal on its natural prey.

Thus, a quite unpredictable set of conditions determines the gravity of any snakebite. Though this sometimes results in little more than temporary physical distress, it rarely fails to produce deep anguish in the victim. These variables offer fertile ground for the shaman or other such intermediary to exercise his "healing" skills, often with success. They have inspired endless varieties of "efficacious" charms and herbal remedies, though, in fact, nothing but prompt injections of specific antisera can truly neutralize potentially lethal bites.[19]

One's concern about obtaining immediate treatment, therefore, is understandable even if, as palliative measures, a tourniquet is used and blood sucked out of the wounded area immediately after a bite. Wherever venomous serpents are found, fear and avoidance of their entire tribe is often amply justified. Victims who are envenomated with lethal doses are sure to suffer one type or another of prolonged, painful symptoms prior to collapse, among them swelling, severe headache, shooting abdominal pains, spasms, drooling, vomiting, necrosis of tissue around the bitten area, kidney damage, hemorrhage, oozing of blood from the body orifices, respiratory difficulties, impairment of vision, and varied combinations of effects resulting from the neurotoxic or hemolyzing effects of the particular poison involved.[20]

Many harmless serpents inflate or flatten their necks and hiss menacingly when excited. Others mimic the color patterns or behavior of poisonous species. The extraordinarily deadly common krait *Bungarus coeruleus* of India is so closely mimicked by the perfectly harmless *Lycodon aulicus* as to promote only dismay in many who can recognize the former. Both prefer to make their homes in or near human habitations—in niches behind cupboards, on ledges, in thatched roofs, in gardens—and resemble each other in size, coloration, pattern of semicircular white lines along the back, and nocturnal habits. Harmless Asiatic species of *Macropisthodon* erect themselves, flattening their necks much as cobras do. The mock cobra *Pseudoxenodon macrops*, whose neck is distensible into a small but distinct hood, occurs over a large area in the eastern Himalayan foothills, Assam, the Burma Hill States, South China, and Java. Just as many nonvenomous species resemble the dangerous ones in appearance or aggressive stance, so also some species of true cobra may not be recognized as such. For example, the "hoodless" true cobra *Naja morganii* may easily be mistaken for a harmless animal, for it expands its hood only very slightly and may not evoke as much terror as its fully hooded relatives, but it is responsible for many deaths, especially in Iraq.[21] Again, the bite of the "innocuous" *yamakagashi* of Japan has a delayed but potentially lethal effect. Popular appellations such as ringhals, boomslang, mamba, krait, copperhead, cottonmouth, death adder, rattlesnake, bushmaster, urutu, terciopelo, phoorsa, coral snake, and others for dangerous

serpents only spell consternation in the minds of people to whom even the nonvenomous species are anathema.

No less confusing to laypeople everywhere is the nature of ophidian activity, for this is directly or indirectly determined by complex interactions of climatologic factors and physiological rhythms due to their lack of a mechanism for regulating body temperature. The diurnal and seasonal variables that influence their metabolic activities include thermoregulatory effects, changes in duration of daylight, sensitivity to direction and intensity of sunlight, hormonal balance, the body's water economy, reproductive physiology, etc.[22] The effects of some of these factors on aggression and mating behavior, often observable in nature, are described in some of the examples below, but we first ought to note some of their normal habits connected with aggressive behavior.

The extremely lethal krait, *Bungarus coeruleus,* according to the distinguished herpetologist F. Wall,

> is one of the most inoffensive of snakes . . . time after time I have recorded the singular timidity of this snake often under the greatest provocation, and only once have I seen one bite at anything in anger. . . . [It is] a sluggard of the most confirmed type . . . lethargic to a degree that is difficult to understand. I have seen it picked up by a parcel of noisy urchins, and carried over a stick, from which it fell off every few yards to be picked up again and again, and without endeavoring to escape or show resentment, a treatment too humiliating for even the defenceless and blind little burrowing snake *Typhlops braminus* to submit to without some struggles and attempts to defend itself.

But this is only because daylight, and especially the direct sun, have a markedly inhibitory effect on the krait. Normally a nocturnally active animal of the Indian subcontinent, it is known to bite sleeping persons. Wall describes several of these attacks, including an atypical case that occurred at midday.[23] The estimated lethal dose of krait venom is very small—no more than two or three milligrams is enough to kill an adult—and, as table 1 proves, a higher proportion of its bites are fatal even with antivenin treatment. G. A. Boulenger, describing a species of krait fron Sind, Pakistan, mentions that in this hot and arid part of the country no one dared to sleep on the cool ground in September for fear of being bitten by this *"pyān,"* the "drinker of blood."[24] Another, independent report confirms the abundance of the Sind variety of krait during September. None of the specimens encountered was under a meter in length; some were over 120 centimeters long and "very vicious" when striking at the surprised victim. No fewer than five pairs were killed within about a month and a half at an army barracks.[25]

About the cobra, Wall writes that its disposition is usually retiring. It is, he says, timid, avoids encounters, and is not inclined to bite, but it can be unaccountably aggressive and vicious. Young cobras are more dangerous than adults.[26]

> A full grown cobra can be handled with perfect safety, but a young one, 10–11 inches long, is so active and its body so small, that it can scarcely be touched with impunity. . . . when the young cobra is hatched, it is very small, very irritable and exceedingly dangerous. Young cobras that hatched out in our Society's rooms killed a Malay python which was placed in their cage, a few days after they were born.

> They attacked it at once, biting it viciously across the back. . . . young cobras seem more on the alert. . . . strike repeatedly and with much malice.

Fraser gives an eyewitness account of the broad-daylight attack of an adult cobra 1.7 meters long on a squatting man quite unaware of its presence behind him.[27] Contrasting comments have been made on the varied moods of the king cobra. While some scholars consider authentic records of cobra attacks on humans scarce, others give vivid descriptions of its unprovoked ferocity and vitality.[28] There are, in Africa, poison-ejecting species of cobra with fangs especially constructed for this purpose. They can take quite accurate aim from distances of about 2½ meters, direct thin jets of venom at the victim's face, and cause severe conjunctival irritation and swelling of the eye and even blindness. These venom-spitting cobras of the genera *Hemachatus* and *Naja* are doubly dangerous in that they are also "very prone to feign death, becoming limp and lifeless. . . . However, great care must be taken not to be bluffed by this shamming [a temporary, instinctive defensive posture] and no liberties should be taken in such circumstances," since they are likely to revive abruptly and spit a jet of venom.[29]

Not all species of vipers can rattle their tails as warnings of their deadly intent. Laurence M. Klauber quotes several field reports to the effect that rattlesnakes are sometimes sluggishly placid, sometimes actively offensive in pursuit of their victims. Similar accounts of the unpredictability of many other species have been recorded frequently all over the world. In general, the skin colors and markings of numerous venomous species so effectively camouflage them on the ground and in vegetation that their victim may to his horror discover, but only moments afterward, the cause of the prick he has felt. *Bitis arietans,* the very dangerous, large-fanged and highly poisonous puff adder found throughout Africa except in extreme desert and tropical rain forest, and *B. gabonica,* the even more lethal Gaboon viper of these forests, account for many deaths because of their habit of basking inconspicuously in the sun. Both are often found stretched out at full length in the path and are generally regarded as sluggish, though in fact the puff adder, especially, is remarkable for its ability "to strike with lightning speed to some distance beyond its seeming reach" when accidentally provoked.[30] Stealthiness and swiftness characterize an attack by any serpent, the victim's anxiety only intensifying as the animal hastily retreats, forestalling identification, or as the pain from a venomous bite becomes increasingly excruciating.

Gigantic reptiles like the python and the anaconda are generally considered inoffensive and sluggish but are on record, though infrequently, as child- or man-eaters.[31] A Reuters dispatch from Dacca recently described a 10-meter-long python's attack on a villager; it had swallowed him up to the waist before an unsuccessful attempt was made to force the animal to disgorge him.[32] I need discuss these gruesome encounters no further if the reader can visualize a serpent's aggressively coiled striking posture and the panic, indeed, fascination, it can suddenly produce in the hapless intruder on its privacy. Herpetological treatises often contain vivid photographs of this posture.

Ecological factors like these will assume great importance when I go on to question the tendency of psychological anthropologists and structuralists to subordinate the factor of fear to whatever other they favor as the prime stimulus for an ophidian myth or cult. We may, therefore, examine prefatorially certain

cultural traditions in which the dominant sentiment is explicit fear and which, at the same time, suggest the weakness of theories that seek order and meaning in the elements of caprice that abound in the animal-centered beliefs of every one of the world's cultures.

BELIEFS ROOTED IN AMBIVALENT AWE

Though it is the extracultural factors that eventually will surface in this book as the primary determinants of ophidiophobia, one ought not to minimize the role of cultural traditions and the psychology of learning and imitative behavior of individual members of a society. The latter determinants are quite distinct: Myths and cults that involve animals are but a part of the process of culture diffusion occurring along the routes of human migrations and, in the course of time, may be lost or perpetuated in modified form. This is amply illustrated by both ethnically related but geographically separated groups and unrelated neighboring ones. The Northwest Coast Indians of Canada and Alaska fear a horrendous legendary creature specifically allied with serpents, just as aboriginal tribes of South and East China—no relations of any American aborigines—have common myths about the real animal, which they venerate as well as fear.[33] On a far wider geographic scale, the well-established migratory history of peoples of Indo-European speech accounts for certain features of deeply rooted myths concerning the enmity between serpents and birds.[34] The Greeks, Aryan Hindus, and Lithuanians, for example, have had strong ambivalent sentiments about serpents. However, one may seriously doubt that culture diffusion accounts for either the abhorrence or the veneration of serpents by a multitude of peoples so isolated as those of the pre-Columbian New and Old Worlds—or even the pre-Christian Irish and Ethiopians, who, according to Winthrop P. Boswell,[35] betray in their ophidian traditions certain common linguistic or other features.

The role of culture diffusion is subordinate or absent in the following instances of the surfacing of an elementary fear of serpents in tradition as a cultural legacy that is often the more remarkable because it is preserved despite the virtual or complete lack of ecological compulsion. We may group the traditions of primitive and civilized societies separately, regard geographical categorization as redundant, and strive for brevity consistent with the usefulness of this information for later chapters:

The Northwest Coast Indians of Canada and Alsaka include several tribes—Nootka, Kwakiutl, Bella Coola, Tsimshian, Haida, and Tlingit. All inhabit a cold maritime or riverine environment rich in fish and game, and this has molded them into hunters and fishermen rather than settled agriculturists. They share essentially the same legends and religious myths, and the animals which dominate these reflect this environment. The deer, the raven, the whale, the salmon, the mink, the sea otter, the squid, the wolf, and the bear—all familiar or useful creatures—are typical. Yet it is the mythical *sisiutl*, usually portrayed with a human head in the middle and a serpent's head at each end (fig. 32), occasionally as *hai' ī' lik* ("feathered serpent"), and sometimes even as a salmon, which occupies a key position in their extensive body of terror-laden myths and superstitions particularly of the Bella Coola, Kwakiutl and Nootka.[36] This is all the more remarkable because serpents are rare and venomous species totally absent

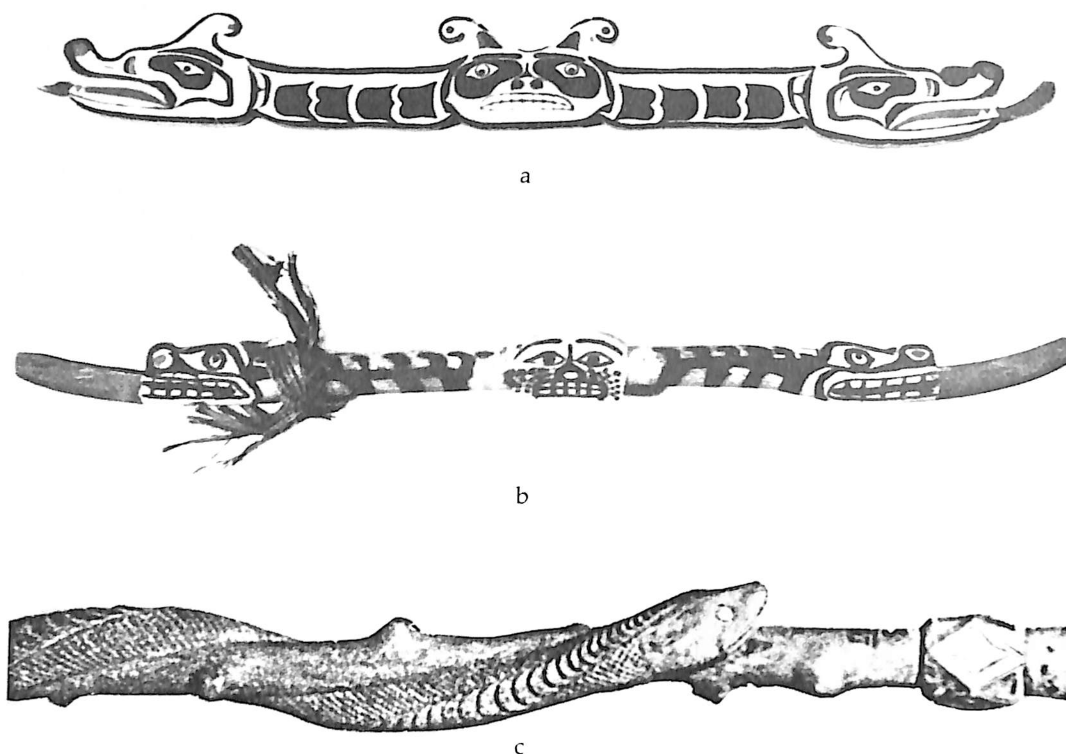


Fig. 32. Shaman's wood batons, Northwest Coast tribes: *a* and *b*, Kwakiutl *sisiutl* representations; *c*, Haida representation of a serpent, naturalistic except for the placement of its ventral scales on the dorsal side. Inlaid mother-of-pearl represents its glistening eyes.

on Vancouver Island where two of these tribes, the Kwakiutl and the Nootka, live, and hence seem to be "memories" retained over countless centuries. The Kwakiutl believe that the mere sight of the *sisiutl* (which is to say, of any serpent) causes fainting. Anyone who sees it must bite his tongue and spit blood. Thunderbirds turn into stone if they touch its dead body. Game is petrified the instant it is shot down by an arrow to which *sisiutl* scales are tied. Even canoes are transformed into stone in the presence of the *sisiutl*. The sight of it produces bodily contortions. Its meat is poisonous. Its clotted blood turns one's skin into stone at the very touch. It is bad luck to touch even the stone on which the serpent has lain. To the Nootka, even small harmless snakes are dreadful because they penetrate the unlucky person through his bodily orifices with lightning speed. The Bella Coola have a similar aversion to live serpents and believe that they enter one's stomach, multiply there, and rupture it or are released through vomit. *Sisiutl* lacks any positive role in human fertility; in fact, to prevent miscarriage a pregnant woman must avoid its gaze.

In cold Lappland, much farther north, serpent myths are not prominent but form part of the sorceror's repertoire. The Same, or Lapps, even today are believed by ignorant folk in northern Europe to possess supernatural powers. Turi, a native Same and one of the few reliable known interpreters of his society, many years ago recounted a myth about a poolside stone and a race run against a serpent to escape the penalty of its bite.[37]

As in some other regions of Oceania, the ethnic groups of the islands of Melanesia have produced a complex of cultures that share certain myths, beliefs in certain sacred plants, and a heritage of Megalithic stonework. The descendants of immigrants who arrived innumerable centuries ago, they may also have shed some of their ancestral traditions and embraced new ones. They have an important shark cult, which is consistent with their insularity, but on many small islands, such as some in the Solomons group and on Rossel, the *figona* serpent cult is "at least as important," despite the rarity of serpents in their fauna and the virtual absence of poisonous ones. Serpent myths are astonishingly well-entrenched: Man was created by a serpent god; clan divisions were instituted by two ophidian deities, Wonajö and Mbasi, who gave each clan its totem; in the "age before man appeared," a tribe of fish (sharks?) was fought and exterminated by five serpent deities (Wonajö, Mbasi, Gadiu, Mbyung, and Nongwa). In the Gilbert, Ellice, and Tokelau Island groups, as in several others, there is a myth in which Father Heaven is separated from Mother Earth to allow their children (mankind) to breathe and have light—a feat "always done by some god in the guise of a serpent or sea-eel." In Kiriwina, the Trobriand Islands, the spirit of one of the ancestral chiefs is thought to reside in a serpent. If the latter is seen by chance, it is an ill omen, and the animal must be given the honors due to a chief and respectfully urged to leave without doing harm or introducing disease. A childhood initiation ritual involves the offer of "food, on leaves, arranged with a carved head affixed to it so as to represent a snake. This again is covered with leaves. The neophytes are brought in and told to uncover the food and eat. Of course the first thing which appears is the snake, of which they are supposed to be very much frightened, and there is a general rush away from it in terror."[38]

In an environment fraught with other, equally or more realistic dangers, the influence of serpents in the culture of upper Amazonian Indian tribes is one of the strongest. The Cubeo claim descent from the anaconda, the animal form assumed by their "first ancestors" when they emerged from the earth. Each sib possesses a list of names indicating its traditional genealogy and shared with sibs collectively known as *aínheme* (from *aín*, "anaconda," and *heme*, "tongue") to signify the "speech of the anaconda" as the source of their ancestors. All serpents—in particular the gigantic but nonvenomous anaconda and boa constrictor, though they very rarely prey on humans—are considered extremely harmful. They are a supernatural enemy of women in labor. They rape menstruating women in manioc gardens or at the river's bank and father a brood of serpents. Death in childbirth is attributed to the woman's having copulated with a boa constrictor.[39] The Desana, Canelo, Jibaro, and the Rio Uaupés Indians also venerate the anaconda or the boa constrictor for many reasons, though they consider them the worst evils. Medicine men carry their skins to control their diabolical spirits. The anaconda is *yacu mama*, "spirit of the streams." Serpents in general are regarded as demons incarnate. The Jibaros make a curious distinction between snakebites that are "natural" and those that are *tunchima* ("bewitched"). The latter are caused by venomous serpents in which a sorcerer has taken up temporary residence. If a nonvenomous serpent bites or if a venomous serpent's bite proves ineffective, this was merely a "natural" bite. If, however, the bitten person dies or becomes ill, the serpent, even if nonvenomous, is *tunchima* and has to be neutralized by sorcery.[40]

The Galla of Ethiopia often carry a leather armlet to avert snakebites. When they encounter a serpent, be it dead or alive, they spit and throw grass on it and utter the words "We are akin and sworn brothers." Men, especially revered individuals, are thought to be transformed into serpents upon their death. They have oracular functions. The incursion of a serpent into a human dwelling is considered beneficial, and milk and butter are always offered to it, yet serpents may also be equated with malevolent ghosts. Galla do not hesitate to kill serpents, burn them, and mix their ashes with ox's blood for use as an offering in their periodic *gādā* or age-grade festivities.[41]

The Kgatla tribes of southeastern Botswana stage elaborate rainmaking ceremonies in which fantasy and a mythical "rain-snake", Kgwanyape, play important roles. The tribal chief sends his doctors to a cave to get serpent's dung with which to smear himself in preparation for these rites. The dung is collected in imaginary encounters with Kgwanyape in its lair, under great fear of being bitten. If the collector feigns unconcern, the animal merely "licks" him. Its eggs, flesh, vomit, hair, and water from its pool are obtained. Fat extracted by burning its meat is mixed with herbal ash and smeared over a twig which is then violently whipped through the air to induce rain.[42]

For a number of ethnically diverse Angolan tribes, the serpent is the most exalted cult object and much feared. To the Humbi, for instance, the python is sacred and is fed and looked after by a special priestess who is one of the king's wives and also married to this serpent. The king rules and derives power from, but never personally has contact with, the creature, for it is regarded simultaneously as powerful benefactor and destroyer. All serpents are considered basically demoniacal; for example, an aquatic species known to the Ngangela as *muchisi* is held responsible for miscarriages, thunder, and the noises that accompany an upset stomach.[43]

"The Sema Naga" of Assam, writes J. H. Hutton, "is very savage when killing is to hand, and he is also addicted to lycanthropy, another savage trait. At the same time, he also displays a horror almost amounting to fear of snakes, frogs, worms and various sorts of creepy-crawly animals. The writer has seen several grown warriors go out of their way to avoid a large death's head moth caterpillar, knowing perfectly well that it was perfectly harmless, and uninfluenced by any special reason, while an old and tried Sema interpreter at Kohima nearly has a fit if confronted with a snake."[44] The animal lore of the Baiga, a Central Indian aboriginal people, is equally rich in tiger and serpent characters. They have a vengeful god, Chitawar, who, when incited by a witch or annoyed, assumes the form of a serpent to bite his adversary.[45]

Among the Aborigines of Australia, the most widespread of mythic beliefs has to do with a gigantic Rainbow Serpent, a primordial creature associated largely with beneficent powers of fertility and water. He (sometimes she) is also the source of magical quartz crystals known as *kimba* from which the medicine man derives his own power. Of the countless myths built around the Rainbow Serpent, those which omit references to its wrathfulness, power to do harm to mankind, or poison are exceptional.[46]

In California, Luiseño and Diegueño Indian boys' puberty ceremonies involved an inordinate number of threats to those who would dare to ignore tribal customs, with death from attacks by various animals—occasionally the bear, puma, and raven, but usually the black spider (tarantula) and rattlesnake, espe-

cially the latter—held out as the typical portent. Alternatively, there were promises of immunity. In the paintings made for these rites, two local varieties of rattlesnake were represented with the utmost care, in extralarge sizes, their eyes marked by *Haliotis* shells, and reminders of the prospect of being bitten by them were issued with remarkable frequency.[47]

The Hopi of New Mexico are famous for the intimacy with which they handled fully fanged rattlesnakes in their annual rain dance rituals, and their methods are important enough to warrant more extensive discussion in the section on serpent-handling societies concluding this chapter. Suffice it now to mention that despite their skill and seemingly reckless abandon, fear of being bitten *(mamkasi)* was freely and frequently expressed by the participants.[48] The day-to-day concerns of the modern Hopi are of interest insofar as they spill over into dreams. Dorothy Eggan,[49] who analyzed ten of their dreams, found that serpents figured in every one of them. Fear of harm was the main theme, sometimes in conjunction with flowing waters or rivers. Palulukon, the mythic water serpent that dwells in the interior of the earth and controls all the waters of the universe, occurred in most of them. Palulukon is conceived as a punisher. Those guilty of misconduct, sexual transgression, etc., incite his wrath, unleashing earthquakes, floods, and other calamities. Ambivalent fear impels the Navajo, a Pueblo group akin to the Hopi, to this prayer: "Dark great serpent, arise to protect me. . . . then I can arise behind you, then I am fully restored behind you! . . . Dangerous beings have not found me, dangerous beings have not found me."[50]

In the myths of the Cherokee, who formerly inhabited the woodlands of the southeastern U.S.A., the sun is a female who hates people (because they make ugly faces when looking at her) and in turn is hated by them. They send venomous serpents to kill the sun—surely an act more indicative of the power of the serpent than of any permanent disrespect of the sun. Serpents also occur very frequently in their myths and superstitions as "supernaturals" intimately connected with rain and the thundergods; they were regarded with mingled fear and reverence and addressed respectfully as "grandfather," "brother," or "uncle." Rattlesnakes were never harmed; they were referred to only in euphemistic or circumlocutory terms, such as "the admirable one," and a bite was announced as a "scratch from a briar." The mere sight of a rattlesnake was believed to produce an eye affliction resulting in ultrasensitivity to light. The inordinately deep-seated Cherokee terror of rattlesnakes is apparent from their attitudes towards even dreams of snakebite, which called upon the medicine man to treat the dreamer as though he had actually been bitten. Herbal decoctions were rubbed upon the part of the body where the "patient" dreamt he had been bitten; the entire complex set of incantations used for cases of actual rattlesnake bite was recited four times, the medicine man on each occasion breathing upon the "wound" four times, and finally the "patient" was secluded for four days.[51]

The appearance of serpents in dreams has been commented upon by many writers. Robert D. Bruce gives much prominence to the dream symbolism of the Lacandon Maya of Mexico, one of the least acculturated Yucatec groups. Dreams involving a rope, or even tobacco, they believe, signify encounters with serpents, and, according to one interpreter, dreams of serpents prophesy death.[52] S. G. Lee's statistical findings on the manifest content of Zulu dreams involve no animal other than the serpent, the latter usually appearing in visualized contexts

of anxiety and assault. Géza Róheim, too, records dreams of Australian Aboriginal medicine men in which serpents have a central role, and like Lee he assigns them sexual symbolism. While non-Freudians may find this interpretation questionable, it is important to be aware that such dreams are on record and that they have approximate counterparts in the ordinary tension- and violence-laden serpent-related myths recounted in detail by other researchers.[53]

The Ainu of Japan worship an ophidian deity, Kinashut kamui, "the spirit chief of all serpents," who is propitiated by women who suffer emotional upsets or bodily ailments believed to have been caused by dreams of serpents or even the sight of one, dead or alive. All serpents are considered vengeful and rancorous when injured or disturbed even accidentally, whereupon they take malicious possession of people. Kinashut kamui's image in serpent form is then used in rites of exorcism. The Ainu, however, are ambivalent in their attitudes, for they also implore this deity for assistance during troubles, for instance, to ease the difficulties of childbirth. Serpents are the companion spirits of shamanesses. In Ainu epic songs, dragons are synonymous with, and literally known as, *hoyau,* "serpents." Always emitting a terrible stench, they are the denizens of lakes and swamps and spell the death of any gods or humans that come too close. They abhor the cold and thrive in heat; hence it is taboo to mention them by the fireside or in summer. Indeed, they are called *sak-somo-ayep,* literally "that which must not be mentioned in the summer."[54] Leo Sternberg gives many details on the "great religious importance of the animal in everyday life" and profusely illustrates its importance in the decorations on ritual and mundane paraphernalia.[55]

Japanese ophidian traditions, however, are not confined to the Ainu. They are traceable also to other early ethnic groups that gave birth to what we now regard as classical Japanese mythology, the bulk of which is built around a conspicuous triad of deities comprising the Shinto pantheon. Susanô, one of these three, is celebrated for his most glorious mythical role, the slaying of a dreaded monster Yamatanoorchi ("Huge-Eight-Forked-Serpent"). According to the *Kojīki:* "It has one body with eight heads and eight tails, and on its body grow not only moss but also cypress and cedar trees. Its length extends over three valleys and eight peaks, and its belly is all constantly bloody and inflamed." The sword obtained by Susanô from one of its tails was a gift given to Amaterasu, the supreme deity of the triad, and later became one of the three divine treasures of Japanese emperors.[56]

The pre-Christian Baltic people were generally "sympathetic" to serpents—the reptile they venerated as a house-snake, a symbol of prosperity and human fertility, was a nonvenomous species referred to as *žaltys* or *gyvate*. Those which shared human dwellings were not only tolerated, but worshipped. Early records speak of the fear and respect evoked in the household as they slithered out of their holes to accept offerings of food. Elena Bradūnas's extensive compilation of Baltic serpent lore points to a common thread in ancient Lithuanian and Latvian folktales and proverbs that have persisted to this day: In most tales, the heroine's husband is generally a serpent, a man named Žaltys (= serpent), or the devil. After the heroine has lived with him several years and borne his children, the serpent- or devil-husband almost invariably is killed by her brothers. Fearful consequences of encounters with serpents in their natural surroundings and unflattering opinions about serpents in general far outnumber

the complimentary—forty-three versus four. The Lithuanians sought to avert snakebites by avoiding direct references to serpents, instead using circumlocutions like "the long one," "the dappled one," "little bird," "pretty little swallow," "cold-tailed one," or "iron one."[57] The object of such circumlocutions, of course, is to avoid summoning a dangerous or uncouth animal by mere utterance of its name and is not confined to the serpent. There are, however, as far as I am aware, few dangerous animals to which indirect references are made so nonderogatorily or in such profusion.[58]

The Hindu list of circumlocutory ophidian epithets, recorded in the classical Sanskrit lexicon *Amarakoṣa* and elsewhere, is far more extensive than the endearing synonyms for the lotus, India's favorite floral symbol, while the tiger, wolf, bear, raptorial birds, scorpion, and other "aggressive" species—including the sacred bull—have no distinctive epithets that match the serpent's. A few of the at least fifty-three that identify the latter, omitting colorful vernacular variants, are *darvīkar* ("ladle-maker," describing the cobra's hood), *dvirasana* ("two-tongued"), *bilaṁgam* or *bileśaya* ("dweller in the hole"), *muktakanculikā* ("she who has cast off her blouse," connoting the ophidian peculiarity of sloughing off skin), *sphaṭa* (onomatopoeia for a hiss, rapid strike, and bite), *dīrghapṛṣṭha* ("long-backed one"), *gūḍhapāda* ("secret [silent]-footed one"), *dṛśkarna* ("perceptive ears"), *dṛśviśa* ("perceptive poison"), *cakṣuśśravāḥ* ("he whose eyes are his ears," signifying good vision compensating for earlessness), *viṣadhara* ("poison-bearer"), *upatṛṇya* ("lurker in the grass"), *dantvatirajjuḥ* ("toothed rope"), *pūtirajjuḥ* ("fetid rope"), *cakrin* ("coiled one"), *pavanabhuja* ("wind-eater"), *dandaśūk* ("toothy-", "biting-", "demoniacal-one"), *sarīṣrpa* (tautological and onomatopoeic combinant suggesting creeping, winding movement while the suffix approximates a literal variant for "serpent"), *kākodara* ("crow-bellied," an unusual derogation), and, sarcastically, *āśīviśa* (poisoned-blessing").[59]

How inveterate is the awe of reptiles may be gauged from explicit statements in ancient Hindu texts. In philosophic discourses on *avidyā* (the nature of ignorance), a favorite metaphor is the fear inspired by a rope taken to be a serpent because it is perceived in the twilight. From the hymns of the Atharva Veda we have the following:

> With my eye do I slay thy eye, with poison do I slay thy poison. O Serpent, die, do not live; back upon thee shall thy poison turn.
> May the serpent, ye gods, not slay us along with our children and our men! The closed jaw shall not snap open, the open one shall not close! Reverence [be] to the divine folk.
> May the closed jaw not open, may the open one not close. The two serpents in this field, man and wife, are both bereft of strength.
> To Indra belongs the first chariot, to the gods the second chariot. . . . the serpent's chariot is the last. It shall hit a post and come to grief.
> Indra slew thy first ancestor, O Serpent, and since they are crushed, what strength, forsooth, can be theirs?

The only other dreadful animals mentioned apotropaically are the scorpion and the wolf, but the hymns devoted to them are fewer and lack the ardor of the ones just quoted. Thus the shepherd's charm "The wolf shall tread a distant path, and the robber one still more distant. On a more distant path shall move *the rope that bites,* the plotter of evil," chanted while symbolically piercing the

ground with a sharpened hardwood pole anointed with clarified butter, is transparently intended for "the serpents that are sprung from the fire, that are sprung from the plants, that are sprung from the water, and originate in lightning; they from whom great brood has sprung in many ways, those serpents do we revere in obeisance."

One of the longest and most moving hymns of the Atharva Veda, with sixty-three stanzas, is intended chiefly for *āgrahāyaṇi* ceremonies, including rites undertaken on the full-moon day of the month of Mārgasirṣa and devoted to serpents. Grass anointed with clarified butter, cow dung, and flowers are placed at the entrances of dwellings to the chant of these stanzas in order to repel serpents. One of these prayers (12. 1.46) epitomizes the fear of serpents unleashed by the rains. It is addressed to Prithvī, the goddess "Earth" of the Hindus: "The serpent—the scorpion with thirsty fangs—that hibernating torpidly lies upon thee; the worm, and whatever living thing, O Earth, moves in the rainy season, shall, when it creeps, not creep upon us: with what is auspicious [on thee] be gracious to us."[60] The odious thought of a serpent creeping over an unsuspecting or sleeping person is concrete in the etymology of an epithet for serpent in Sanskrit and in the demotic Pali: Urag and Uraṅg. In both, the prefix *ur* is derived from *uras*, "breast, bosom." The suffix *ag* means "to wind, curl, move tortuously in a zigzag way;" as an adjective it also means "serpent," while *Aṅg* signifies "body;" thus *urasgāmin* connotes a "going over the breast, specifically [by] a reptile." The *Garuḍa Purāṅa* and the *Kāmaratna Tantra* are but two of several Hindu texts that specify incantations (some to be recited five thousand times) to guarantee recoveries from snakebite and keep dwellings free from intruding serpents.[61]

In ancient Egypt, mortuary texts regarded serpents as menaces even to the dead. Among the charms inscribed within the tomb-chambers of the pyramids of the pharaohs Unis, Teti, and Seti I (ca. 2600–1290 B.C.) are "Back with thee, hidden snake! Hide thyself! Thou shalt not make King Unis see thee. Back with thee. Back with thee, hidden snake! Hide Thyself! Thou shalt not come to the place where King Unis is, turn about, turn about, O Monster, lie down."[62] The Pyramid Texts have several antiserpent spells, among them "A face is on you, O you in your bush; you are laid down. O you in your hole!" and "O evil-doer, evil-doer, creeper, creeper. Put your face behind you, beware of the Great Door" (the tomb door with two large protective eyes to ward off intruders).[63] The early Pyramid Texts refer to a "serpent game" that was intended for the spirits of deceased pharaohs. The object of winning it was to seek freedom from dangers lurking in the netherworld, their defeat symbolized by a serpent whose coiled body was envisioned as hacked into pieces. The game was "played" on a spiral track comprising this mutilated body carved in relief on an alabaster or gilt wood plate, upon which the pharaoh's spirit was supposed to roll a marble so as to make it skip away from the mouth into a radial groove and thence "escape" to the tail end (fig. 33).[64]

It is important to recall a point made by James Breasted many years ago specifically concerning the Pyramid Texts, in which a distinction between prayers and charms is generally difficult to make because a text or a character originally in no way connected or identified with magical formulae may, nevertheless, be employed as such. Breasted gives examples of a sun hymn and other archaic hymns to the goddess Nut, which, he writes, have with no



Fig. 33. The Pharaoh's "snake-game" board, limestone, Pre-dynastic, 4000–3200 B.C., Ballas, Egypt.

justification been called charms by some Egyptologists, whereas "the serpent charms are distinguishable as such at the "first glance in most cases" and therefore stand apart.[65] I should add that the enemy against which *protective* charms were most often directed is serpents, not maggots, beatles, or scorpions, which can just as easily invade a burial chamber and ravage a corpse. But part of the reason also lay in the myth of the sun god Re, who was bitten by a serpent sent by Isis to force him to reveal his secret name. Deceased pharaohs, because they were identified with Re, were expected to encounter the same fate and therefore needed protection.

An Egyptian spell with a possible metaphoric allusion to Seth, the antigod, is entitled *Book for Freeing a House from the Poison of Any Snake, Male or Female.* The precise identity of the animal or animals in whose guise Seth is cast in Egyptian iconography is uncertain. "That Seth has his chthonic affinities is undeniable," according to John Griffiths, since it may well be that he is the unnamed enemy "who is come forth from the earth" (in the words of one text) and is associated with serpents hostile to the sky god Horus.[66]

The Egyptians also sought the patronage of benevolent serpents: Nehebkau, a god whose ophidian form and qualities are markedly stressed in art and religious texts, was invoked for the protection of dwellings from serpents entering through a hole in the wall or door. Yet, Nehebkau's origins are *essentially sinister*, and in certain texts he is appropriately paired with a scorpion goddess, Selket. In others, the leonine goddess Sekhmet and the cat goddess Bastet make their enmity to Nehebkau and his serpent confreres quite plain. A representation of Sekhmet, for example, shows her grasping a serpent in each hand, with a accompanying statement that she is "the eye of Re . . . subduing the rebels."[67]

In Egypt, the special powers of the serpent derive from the same divine substance as that of the fiery sun eye, the "fiery Horus eye"—a metaphor in turn derived from comparison of the burning effects of venom and the sun and from a myth which endowed the celestial god Horus with two eyes in his forehead. In one of the Coffin Texts,[68] the uraeus serpent (the cobra) exclaims:

> I am the fiery Horus eye, sprung from terror, the mistress of fear, great in strength, emerged from the fire of the radiance, she to whom Re has given her appearance, whose form Re has established, to whom Re has said: "Greatly are you feared, great is your strength, great is your anger, great are your magical powers over your enemies. You have prostrated the adversaries. Truly you have brought humanity within your power, that they are afraid when they see you in this your new form . . . see, it [the Horus eye] is stronger than all the gods, none can approach me except Re-Atum, for he has set me as a diadem on [his] head.

In general, the Egyptians tended to imagine all threats to light or the sun as serpent demons, and the archenemy of the sky/heaven and the original gods was seen as a mighty serpent whom the sun god had to conquer in a fierce struggle that recurred every morning. Called Apopis and cursed by appellations such as "the enemy," "evil one," "the one to be repulsed," and "he who is worthy of destruction," this monster demon of darkness epitomized the Egyptians' fear of the night. Atum had first to win "the legacy of Heliopolis" in a battle with a serpent, yet he, too, as Hermann Kees points out, can, like "the original gods and the [scarab beetle god] Khepri [who personified the rising sun] take on the form of a serpent."[69] One of the clearest illustrations of the ambivalent awe occurs in the *Book of Am-Duat* (Book of What Is in the Netherworld), a composition of New Kingdom Egypt rooted in the theological speculations of much earlier times. Its main theme is frequently depicted in paintings on walls of tombs, notably that of the Pharaoh Amenhotep II. In these the sun god Re's nightly subterranean journey is typically envisioned as taking place on a barge with a scarab on its prow towed by gods and goddesses. Re's barge is led by a huge serpent, the last stage of transformation before birth. The *Am-Duat* text is specific: These deities "tow this Great God inside the backbone of the serpent, Life of the Gods. Those who are honored by Re . . . their births take place upon earth every day after this Great God is born in the East of the Sky. They enter the mysterious image of the serpent, Life of the Gods, as the honored ones. They come out as the Youths of Re every day." The ambivalence resides in the belief that, while Re's barge—i.e., the planet sun itself—is nightly assailed in the Netherworld by the evil serpent Apopis, its safety is ensured by another serpent, Mehen, whose protective coils encircle the sun god's cabin. In the Pyramid

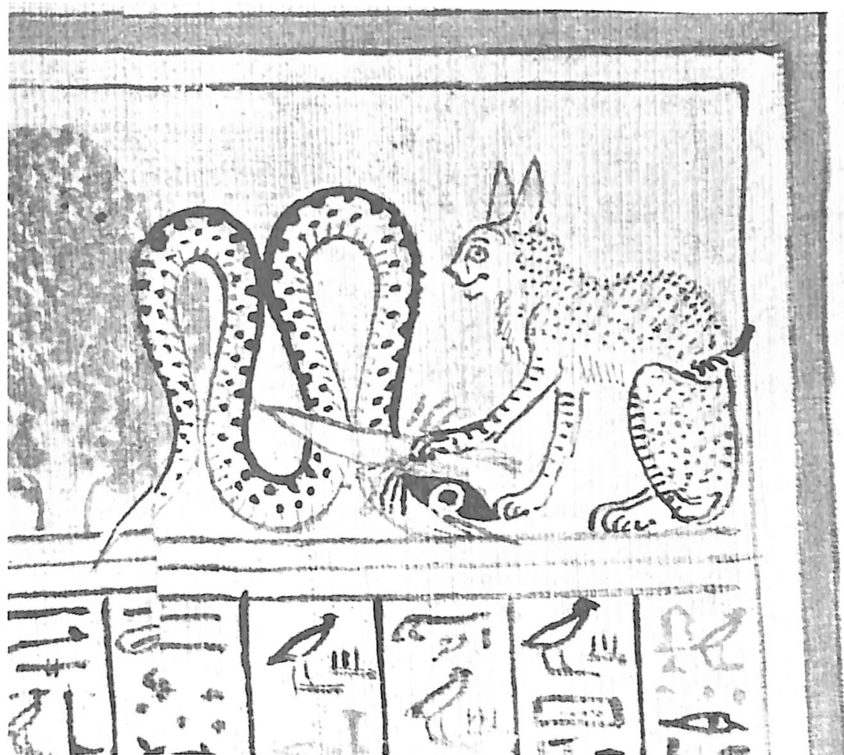


Fig. 34. The antigod Apopis being slaughtered by Mafdet, the "male cat of [the sungod] Re," from the Papyrus of Hunefer, 1304–1290 B.C.

Texts a cat (or lynx), as the sworn foe of serpent demons, is shown destroying two of them, In-dif and Djeser-tep, who are regarded as dangerous to the deceased, and in the *Book of the Dead* the evil Apopis is shown being slaughtered by Mafdet, "the male cat of Re" (fig. 34).[70]

Apotropaisms like these, whose origins surely lie in the fears of the earliest settlers of the Nile Valley, continue right through Early Dynastic to Late Ptolemaic times. Their importance is evident in inscriptions on hundreds of the cippi, or apotropaic statuettes, common in Egyptological collections, whose purpose was to prevent or heal snakebites, the stings of scorpions, and injury by dangerous animals. Early ones usually show the god Horus, depicted as a young man or child, treading upon the body or bodies of crocodiles or serpents and almost invariably also clutching in each hand serpents, scorpions, and sometimes oryxs and lions. There may be hieroglyphs inscribed, such as "Back, thou-evil-doer! . . . enchanted forsooth is the Ennead of Re by the *nʿy*-serpent. Bitten is the child; bitten is the youth by *djeser-tep* [a phrase meaning the cobra, literally "erect of head"]." An especially fine specimen from the late period represents the household god Bes as an old man. An aureole of venom-bearing terminal segments of a scorpion's tail surrounds him decoratively as he stands over wild beasts enclosed within a corral formed by an enormous serpent. Bes here is ithyphallic, and, as if to recall the proverbial feline enmity towards serpents, his penis terminates as a cat's head (fig. 35).[71]

As in the Nile basin, so in the Euphrates-Tigris countryside, serpents and



Fig. 35. Apotropaic faience plaque portraying the god Bes, Ptolemaic period, early third century B.C., Egypt. Bes's erect penis ends as the head of a cat, in Egypt the serpent's proverbial enemy. His feet mimic the "jackal"-headed god Upwawet, and he has the wings and tail of the falcon-god Horus—both gods the serpent's antagonists. A large circular serpent, which encloses various other species and symbolizes the dangers of the wild, is impaled by two spears. The venomous, terminal tail segments of a scorpion form the plaque's border. Also see fig. 75.

scorpions must have been a scourge for countless millennia before the growth of the riverine Neolithic agricultural settlements of Mesopotamia. The Mesopotamians used charms to protect houses from their intrusions.[72] It is possible that their mythology was partly inspired by the ravages of serpents seasonally flooded out of their lairs. Sirsir, the boatman's god, may have been ophidian.[73] If so, this is also consistent with the shipping activities of the ancient Mesopota-

mians in the Persian Gulf, where sea snakes, all of them deadly venomous, are a threat to swimmers and pearl divers even today.

At any rate, the creatures of Kur in the Sumerian myth of the primeval waters and the dragon slaying that is a part of this aquatic theme are clearly the models for the much later, and much more vivid, Babylonian creation epic *Enūma elish*. "Even a superficial examination," according to S. N. Kramer, "reveals Sumerian origin and influence. The very names of the protagonists are in large part Sumerian." Kingu, Tiamat, and her brood, who dwell in the chaotic abyss of the primeval ocean, are "monster-serpents, sharp of tooth, unsparing of fang. With venom for blood she has filled their bodies. Roaring dragons she has clothed with terror . . . that, with their bodies reared-up, none might turn them back."[74] They are the archetype of the artistically complex, fantastic hybrid form repeatedly represented in the enameled bricks of the well-known Ishtar gate of Babylon, a form that defies zoological categorization (fig. 36). The whole body, except for legs and snout, is scaly, and the long, thin neck bears the head of a horned viper. The body itself is that of a large, swift-running mammal whose forelegs are feline and hindlegs those of a bird of prey. To call this a dragon, as is customary, is almost an injustice to the ophidian character of its forebears. This is clear from its Sumerian as well as Akkadian appellations *muš-huš* (literally, *muš* is "serpent," while *huš* signifies ferocity, wrath, rage, violence) and the equally terrifying variants *muš-maḫ* ("python") and *muš-šà.tur* ([poisonous] "wombsnake"). Cuneiform inscriptions on clay tablets from ancient Sumeria make frequent direct references to its "terrifying," "dreadful," "furious," or "raging" aspects, its "inextricable coils," venom, eyes, tongue, and mouth, and the crushing of its head underfoot. Some of these are temple hymns invoking Ningishzida and Niraḫ, gods whose primary attributes are distinctly ophidian, Ninurta (Ningirsu), and the goddess Inanna, who also has ophidian (and sometimes other) associations.[75] The deeds of Ningishzida, "python, great dragon" and Ninurta, "dragon with the fearsome glance, wombsnake, who sprays poison on the unruly land," are often impetuous. Other hymns refer to "the holy viper" and "wombsnake" that served as bolts and locks on temple doors and on the gates of towns (such as Der, whose goddess, Kadi, had ophidian attributes) in order to spread awe, terror, and subservience among devotees and enemies alike.[76] Most importantly, cuneiform texts refer to Dumuzi, the deity central to some of the most significant Sumerian and Assyrio-Babylonian cultic rituals, as "Damu [the 'child'] . . . the first one, fierce *muš-huš*."[77]

Metaphors like these are consistent with the observations of many who have analyzed ancient Mesopotamian religion. Thus, commenting upon the Sumerians' fear of their deities, who were generally conceived as anthropomorphs though they may have had animal symbols, Helmer Ringgren writes that they took the view that man was created for the express purpose of serving them and providing them with food, drink, and lodging. The sacrifices in the many temples were therefore man's first duty, and the responsibility for seeing that these were carried out correctly rested upon the king. Sacrifices and hymns were meant to increase the strength and potency of the gods, and devotees' attitudes "fluctuated on the one hand . . . between close, almost sentimental relationship to the gods of the Dumuzi type, on the other the respectful attitude to most other gods, which sometimes almost goes as far as literal fear of their 'terrible' divine gaze"[78]—might one say, at least about the deities with ophidian associations, their *fascinating* gaze? Mesopotamian art is replete with

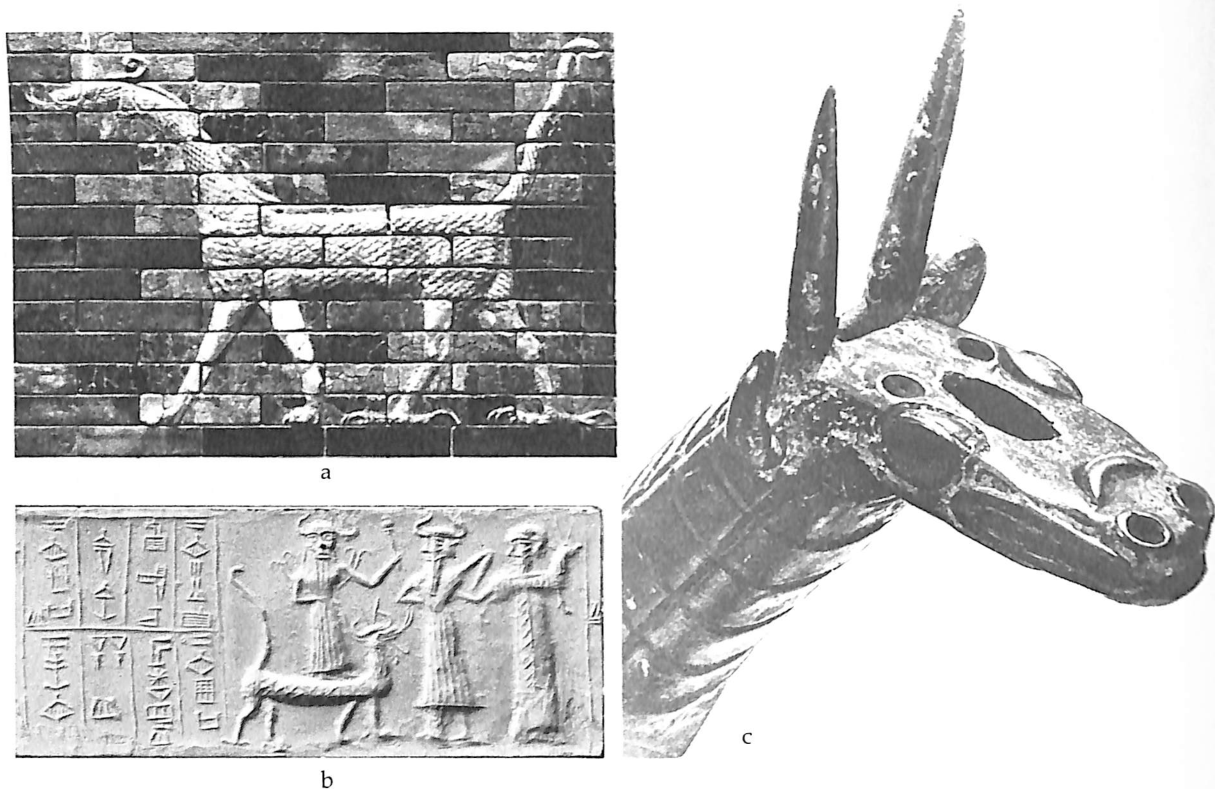


Fig. 36. The Mesopotamian dragon *muš-huš: a,* in colored, glazed brick from the Ishtar Gate, one of the city gates of Babylon, sixth century, B.C.; *b,* in an Akkadian cylinder-seal impression; *c,* as a bronze icon. The tongue is clearly bifid in *a* and *b.*

examples (such as the "eye"-goddess of Tell Brak) of an extraordinary infusion of power in the shape and size of eyes.

Two important Ugaritic clay tables provide an insight into the seriousness of serpent charms and social attitudes towards serpents in Semitic religions rooted in Mesopotamia.[79] The Canaanite inscriptions from Ugarit are incantations addressed to the sun goddess Šapš by her daughter Pḥlt and are meant to overcome the serpent's ability to inject its venom. Apart from the imaginary aspects of the ways in which the various gods and goddesses "picked the venom" or "tore the venom from the mouth of the biter . . . the destroyer . . . the devourer," the strophes are eloquent comments on the knowledge possessed by the priests of Ugarit about the anatomy and the ways of serpents. They are incantations intended to prevent, rather than heal, venomous bites, and they imply the handling of live serpents for the purpose of actual, symbolic removal of their poison glands—as if in answer to the Israelite god Yahweh's vengeful utterance "For behold, I am sending among you serpents, adders against whom there is no charm, and they shall bite you."[80] One of the Ugaritic strophes is of much interest: "Give as *mhr* [marriage price] serpents! An adder give as my marriage price, and sons of asp, [as] my love gift!" says Pḥlt to her suitor Ḥoron, who agrees. This episode is a sequel to Ḥoron's earlier reluctance to help the goddess in her action against serpents, whereupon, in anger, she has rendered him

impotent. But Ḥoron magically recovers his virility, becoming more vigorous than ever, and the goddess alters her approach to secure his future cooperation. The lines just quoted are part of Pḥlt's proposal to become his wife in return for his promise to capture and destroy serpents by conjuration,[81] and, like other sentiments explicit in the Ugaritic inscriptions, they tell us much more about these animals as an affliction than as a sexual symbol—which, of course, they also sometimes are in Semitic religions other than Islam.

Among the goddesses prevalent in popular Hebrew religion up to the First Exile of 586 B.C., the Matronit, goddess of the Kabbala, figures prominently. Like many goddesses of other religions, she possessed aspects of bloodthirstiness and lawful promiscuity, though these were balanced by a basic chastity. According to one version,[82]

> Every year the people of Israel sinned with tragic inevitability, which enable Samael, the Satan (or Azazel), to bend the Matronit to his will. Samael in the form of a serpent, or riding a serpent, lurks at all times near [her] privy parts in the hope of being able to penetrate her. Whether or not he succeeds in gratifying his desire depends on the behavior of Israel. As long as Israel remains virtuous, Samael's lustful design is frustrated, but when he has the opportunity he glues himself to her body with the adhesive force of resin and defiles her.

The point is that in order to profane the Matronit, Samael—the prince of evil, the fearsome "venom of God" who "slays men with a drop of poison"—takes the form of the repulsive serpent and not of any other creature.

The *Avot*, one of the best-known Talmudic texts on aspects of life expounded by the Jewish sages, mentions, as one of the miracles of the Second Temple period, that "no serpent or scorpion inflicted injury in Jerusalem."[83] "Even with the best of serpents, crush its head" is a Jewish proverb. Jews are permitted to kill the common viper, "the serpent of Israel," even on their Sabbath. The Jerusalem Talmud condones defensive killing—consistent with the long-standing Semitic attitude concretized in the Old Testament curse leveled against the serpent, that man "shall bruise thy head, and thou shalt bruise his heel."[84] Yet, there is also a contrary directive: During their solemn Amidah prayers Jews must desist from killing serpents "even if one is coiled around one's heel."[85]

The awe reflected in these customs can be traced back to far earlier "pagan" elements in, and historical links between, Canaanite and Israelite religions. Calumniation of the serpent is essentially a later development. During the reforms of the Judaean kingdom early in the first millennium B.C., idols of the goddess Asherah (= Astarte, whose cult symbols were primarily ophidian) were disavowed and burnt, yet backslidings to the worship of this "abomination" were frequent in popular religion. Her image remained in the Jerusalem temple until Hezekiah destroyed it and "broke into pieces the Brazen Serpent which Moses had made, for unto those days the children of Israel used to burn incense to it." No sooner was Hezekiah dead than his son Manasseh (698–642 B.C.) reverted to the old customs, but without replacing the Brazen Serpent, which, by then, had lost its significance. Mythic monsters like Leviathan, the sea serpent Rahab, the "coiled serpent," and the "fleeing serpent" are just as much a part of Israelite religious heritage as the despised tempter of Eden and symbol of

Satan. It is, then, hardly surprising that Yahweh, *the* God, the one and only supernal power in Torah literature and Israelite monotheism, includes Satan as a member of his divine court.[86]

Ambivalent attitudes like these are deeply rooted in the cultural histories of all the Semitic peoples, most remarkably in Islam, which deliberately rejects or revises many of the religious traditions of its precursors. Since I have elsewhere discussed at length the place of the serpent in Muslim beliefs, suffice it now to mention a case or two: The pre-Islamic Arabs imposed a strict rule protecting any animal that accidentally wandered into the *ḥima* or sacred ground around their stone idols. This convention persists in modern Islam with the difference that five animals are exempted and may legitimately be killed: the serpent (with which the scorpion is allied by one authority on Hadith, Ibn Hanbal) and, for reasons not pertinent here, the innocuous mouse, vulture, crow, and dog, all of which are regarded as *fāsiq* ("sinful," "perverse"). However, with the exception of the scorpion, only the serpent is a potentially dangerous intruder whose killing is justifiable. There is, furthermore, an etymological facet—the Arabic word *ḥayāt*, "life," is cognate with, and hence glorifies none other than, *ḥayya*, "serpent." Islam today possesses a rich heritage of beliefs that betray pronounced ambivalent awe of the serpent as evidenced by numerous statements which Hadith credits to Muhammad himself and to those representing him. The treasures beneath the Kaaba, Islam's most venerable shrine, "are guarded by a white serpent with a black head and black tail, a head like that of a he-goat . . . This monster dwells in a pit under the sanctuary, having been sent there by Allah. . . . some people say that this creature will speak to mankind on the day of resurrection." Hadith cites Muhammad's injunction: "kill the serpents; kill those having two stripes on their backs and those that have no tails; for these are two kinds mere sight of which causes miscarriage in pregnant women." Yet, "It is forbidden to kill serpents that dwell in human habitations . . . [for these are] the familiars," a sentiment at odds with another to the effect that "we have not reconciled with them since the very first time we waged war upon them."[87]

In ancient Greece, circumlocutions like *oidípois*, "swollen feet," and *kálos*, "rope," were on occasion used for the serpent. The myth of Kadmos involves his killing of the fearsome serpent that guards the lustral waters at the spring of Ares and, on Athena's advice, the sowing of its teeth, from which spring the "earth-born ones" (more serpents). Enraged, Ares tries to kill Kadmos but is prevented from doing so by Zeus.[88] As Meilikhios, Zeus is not only a "god of love," "gentle," and the "gracious, easy-to-be entreated one," but also "a god of vengeance, father of gods and men . . . figured by his worshippers as a [bearded] snake" (fig. 37).[89]

Jane E. Harrison describes the Erinyes in Homer as

> terrors unseen: Homer who lends to his Olympians such clear human outlines has no embodied shape for these underworld Angry Ones; he knows full well what they do, but not how they look. He has to bring his Erinyes in flesh and blood actually on the stage, he must make up his mind who and what they are. . . . Up to the time that Aeschylus brought them on the stage, no one, if he had been asked what an Erinys was like, could have given any definite answer; they were unseen horrors which art up to that time had never crystallized into set form. . . . [Aeschylus's] intent was to humanize the Erinyes that they might be the more inhuman. The more horrible the shape of these impersonations of the old order the greater the miracle of their


a

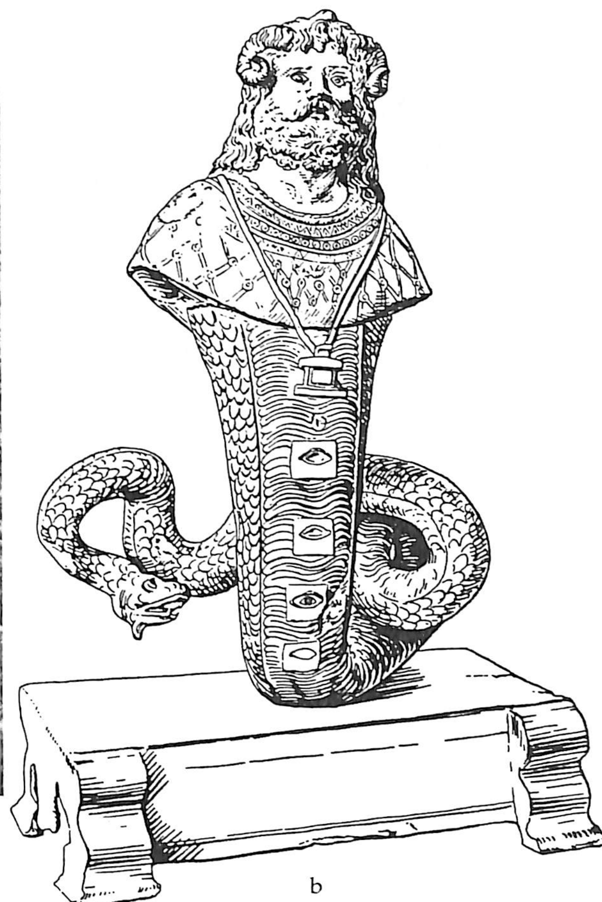

b

Fig. 37. The god Zeus in Greek art: *a*, as Meilikhios; *b*, as Ámmon.

> conversion into the gentle Semnae, and yet the easier, for so early as we know them, the Semnae are goddesses, human as well as humane.

Forced to give them human form on the stage, Aechylus leaves no doubt that these vengeful and horrific characters are serpents. To Euripedes, too, the Erinyes unquestionably are serpents—"Hades serpents," "dread vipers, open-mouthed," "maidens with the form of serpents"—and subsequent Greek art and literature amply attest to the convention of embodying dread purpose in serpent form.[90]

Greek religion was replete with divinities and semidivinities with ophidian emblems or attributes. Some of these heroic personages rode celestial, solar chariots drawn by serpents of monstrous size. Dracontius underlines the latter's fearsomeness even when they are in this manner associated with benevolent deities: "Then came the serpents/ Raising their combs aloft and viperous throats/ Scaly; and lo, their crested crowns shot flame./ The chariot was a torch, sulphur the yoke,/ The pole bitumen; cypress was the wheel;/ Yea, poison made that bridle-bit compact,/ And lead that axle, stolen from five tombs."[91]

In Chinese beliefs, Shê-Wang and Shê-mo Wang are, respectively, the "Celestial King of Serpents" and the "Serpent King of Devils," both of whom were propitiated in fear of their evil potentials. The former was generally represented, as at his shrine at Su-Chou Fu (Soochow), as serpent-bodied, less often as a man with a bifid tongue or even a Buddhist priest with a mythic ophidian connection. Shê-mo Wang, on the other hand, was the Spirit of Fire metamorphosed into a serpent, originally chained up in a cave but later freed out of pity by a king. It was customary in some parts of China to parade live serpents (to bring luck) in processions in honor of the Serpent King. Yet if a serpent were to creep into one's premises, its tracks would be rubbed out with manure and the householder would immediately seek reassurance at the local shrine. Little children's foreheads were daubed with the character *wang* ("king") during the feast on the night of the fifth moon, and yellow paint was smeared on their legs as a charm against snake- and centipede-bites. Ta-wang ("great king") appears to be a taboo term for serpent deities in general, and at least one deity, Ch'ing-lung ("green dragon"), is addressed as Ta-wang and commonly regarded as a serpent with the character *wang* on its head. The literal Chinese vernacular word for serpent is taboo in at least two provinces, Kwangsi and Kwangtung.[92]

In civilized pre-Columbian Meso- and South America, monumental iconography and pottery motifs include such fearsome ophidian images as an enormous statue of the Aztec goddess Coatlicue (fig. 38).[93] Precise details of cult observances and the pantheons are lacking because of the absence of scripts among almost all the peoples of these regions and also because decipherment of the hieroglyphs of the two or three societies that did possess these is quite incomplete. One therefore has to look carefully for vestiges of authentic features of ancient rites, few of which survive today among their Catholicized descendants. Thus, the liturgical aspects of serpent veneration directly inspired by fear of this animal or, by extension, of the deities modeled upon it are unknown except for limited accounts in early postconquest Spanish colonial records from Mexico, Guatemala, Ecuador, Colombia, and Peru.

Ruiz de Alarcón's compendious records, dating to about 1628, include the religious customs, witchcraft, and superstitions of Mesoamerica, mostly of the Aztecs, whose prayers in Nahuatl he cites with Spanish renderings alongside. The serpent is exalted in its early pages. All serpents, especially rattlesnakes, were believed to possess augural significance, not a few of them baleful. Superstition endowed them with all manner of powers to influence human affairs. They were the cause of natural calamities such as eclipses, famines, and epidemics. Exaggerated bodily proportions and destructive prowess were imagined especially in the case of two greatly feared species known as *maçacoatl* and *metlapilcoatl* or *çelcoatl*. Aztec prayers repeatedly invoke "my sister, the serpent," or "the robed one," importuning the animal to desist from causing ruin, bodily harm, or untimely death.[94] The attention given to venom in ritual is also evident in Diego Durán's writings of about 1650. He frequently mentions a "divine" pitch called *teotlacualli* ("food of the gods") which priests would smear on themselves from head to foot before proceeding with sacrifices to idols housed in sacred caves. This pitch was always made from the crushed parts of poisonous animals—vipers, scorpions, centipedes, and spiders—and its main purpose was to quell fear of attack by wild beasts.[95]

Serna, writing in 1647 about the Huastecs of the Gulf Coast of Mexico,



Fig. 38. Massive andesite statue of the goddess Coatlicue, found in the main plaza of Mexico City, late fifteenth century.

mentions their custom of burying a person face down, in contrast to the normal face-up position, if he had been killed by snakebite in the belief that otherwise torrents of devastating rain would pour for four days without cease. A deadly venomous species they knew as *mahuaquite*, whose bite was regarded as certain to lead to a violently painful end, was feared in particular.[96] Modern Yucatec Maya have a plant, the *chay (Jatropha aconitifolia)*, which is believed to ward off evil spirits that assume animal form—chiefly that of the mythical serpent, the Chay Can, which is thought to eat its leaves and is reputed to pursue nursing women, insert its two tails in their nostrils, and suffocate them while sucking on their breasts.[97]

Up to early conquest times, the Indians of Bolivia venerated two ophidian deities, Yaurinkha and Huayra-tata. The former was a lake-dwelling monster-serpent whose every movement produced earth tremors. The idol of the other, represented as a double-headed human figure with coiled serpents disposed from head to foot as its attributes, was associated with hurricane winds and fertilizing rains.[98] Quechua myths prominently feature a monstrous and malignant double-headed, lake-dwelling serpent known as Amaru. De Avila, writing in about 1598, classified it under "Dioses y Heroes," making clear at least its semidivine nature. One myth recounts how it turned into stone on being vengefully stabbed in the back. The highlanders of Cuzco, wrote de Avila, believed that it still existed near the village of Caquiyoca, where the stone identified with its remains was scraped and powdered for medicinal use.[99] The daily prayers of certain contemporary Bolivian Indians are explicit about fear. Before setting out for work, they implore their deity not to forget to tie up his "dogs" (i.e., serpents) so as to prevent them from biting. The unquestioned medicinal value they attached to serpent parts was but an inveterate acknowledgment of reptilian power over their lives.[100]

AWE INDUCED BY OPHIDIAN BODY FORM AND BEHAVIOR

Cases like those cited above might be multiplied greatly to emphasize the primary significance of fear of venom as a factor in the ambivalent veneration and revulsion engendered by serpents; but ophidian peculiarities that offer opportunities for endless variations in artistic caricature, myth, and symbolism merit special notice. This category includes oddities of ophidian behavior and bodily characteristics that have impressed modern students of reptilian biology as strongly as primitive man, always a keen observer of the ways of animals around him.

Oddities of "automatic," reflex ophidian behavior arising from the low order of development of the reptilian nervous system and absence of thermoregulation are innumerable. They only reinforce the mysteriousness of the serpent and generate myths of its supernatural prowess. One of the consequences of the high degree of functional autonomy of the reptilian spinal cord and the poorly developed brain is exemplified by the prolonged, vigorous movements of a serpent's body after its severance from the head, whose vitality, too, is markedly refractory. Klauber quotes a correspondent who had decapitated a rattlesnake, leaving only half an inch of its body attached to the head. This had lain for fifteen minutes in the laboratory before being approached for its venom, whereupon "suddenly its mouth flew wider open and came shut like a mouse trap,

sinking both fangs in the end of my middle finger."[101] H. V. Biggs reports that he cut a 1¾-meter-long cobra "clean in two," about equal halves, with a shotgun blast. The animal left a pool of blood, yet returned for a fight, showing tremendous vigor, resistance to death, and a frightening ferocity.[102] No person who has ever witnessed a serpent writhing after it has been clubbed over the head or had its body hacked into two can have remained unimpressed by such resilience. Tales such as that of the hydra in Greek myth redound to the animal's reputation for vitality as eloquently as the proverbial rejuvenatory symbolism attached to the sloughing of a serpent's skin.[103]

Oddities of instinctive, mechanical ophidian behavior commonly observed in nature are often comical: W. H. Traill describes a 60-centimeter-long krait caught in the frustrating act of swallowing another serpent 94 centimeters long, the belly of the latter already distended by a recent meal—a lizard measuring 30 centimeters.[104] A 70-centimeter-long krait was seen stalemated in its attempt to swallow a krait almost twice its length.[105] In yet another case, a house-dwelling krait, pulled out of a hole from which its tail end was exposed, was found to have gorged upon a second krait, which, in turn, had choked itself on a third. Two captive pythons, a large specimen and a smaller one, shared a cage in the Bombay Natural History Society's rooms. Both commenced a meal—a partridge—simultaneously, one seizing the bird by its head and the other by its tail: "the big python went steadily on. The presence of a rival did not disturb him. He swallowed the partridge, his brother python and the red blanket around which the smaller python was initially coiled."[106] Reports of cannibalism among rattlesnakes are infrequent, but Klauber attests that they will swallow not only individuals of other (usually smaller) species, dead or alive, but also on occasion their own young.[107] It is doubtful, however, that any serpent can or has ever been known to attempt to bite or "swallow" its own tail. Yet the seeds of this thought, suggested by the very form of its body, have frequently germinated into an artistic symbol which Western scholars call "ouroboros."

One of the earliest known ouroboros motifs occurs on a pot of the Neolithic Yang-shao culture of China, ca. 4500 B.C. Suggesting the incipience of the dragon motif,[108] though hind feet are lacking, the body of the serpentine zoomorph painted on it is differentiated into dark and light (cross-hatched) halves—perhaps to indicate some concept involving cyclic periodicity, such as day versus night or dark and bright halves of the lunar month (fig. 39*a*). This concept is quite explicit in an engraving on a bronze vessel from the Western Chou (1122–1011 B.C.) period (fig. 39*b*). Consisting of fourteen stylized segments exactly corresponding in number to the phases of the bright-half period of the moon, their graded sizes, furthermore, symbolically suggest its waning and ultimate extinction.

The ouroboros motif is also known elsewhere: It is common in the ancient Near East, for example, in the third millennium B.C., at Susa, the capital of the Elamites, among whom a strong serpent cult existed.[109] In India, in the Jaina religion and in some Hindu tantric cults, the motif expresses the fundamental philosophical concept of the two contrasting attributes of time—ascending *(utsarpiṇī)* and descending *(avasarpiṇī)* epochs of rising hope in the world order and increasingly imminent annihilation following each other in ceaseless cyclicity, time itself being envisioned as a serpent commencing to swallow its tail. The ancient Egyptians, too, depicted the motif in their predynastic epoch, but its

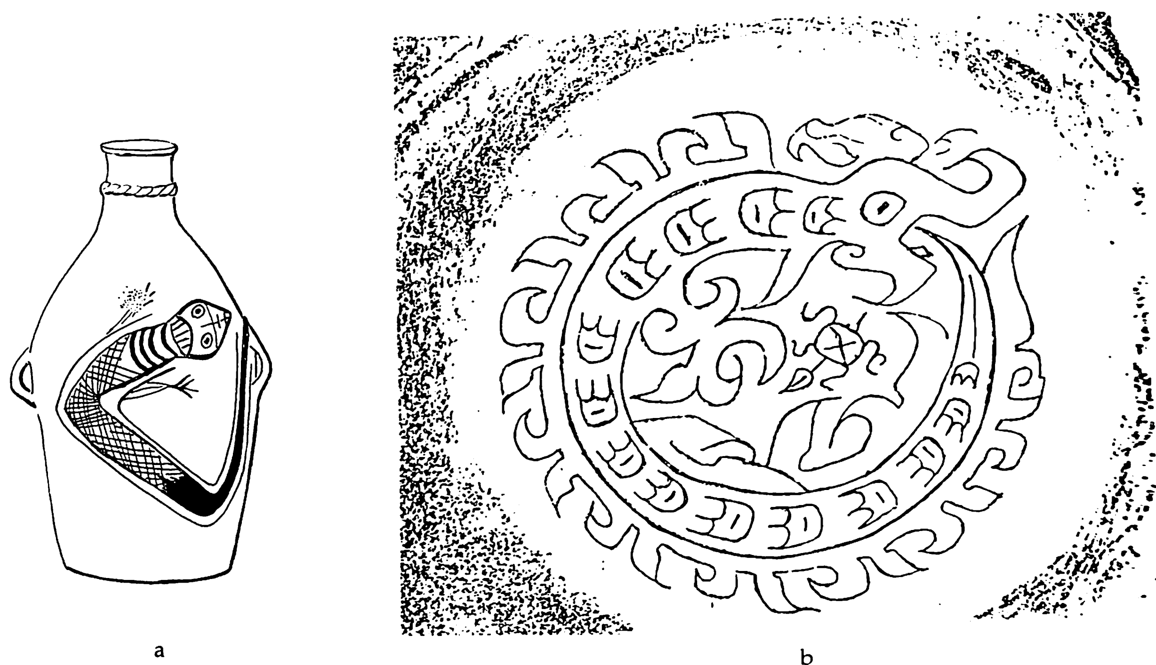


Fig. 39. Ouroboros: *a*, painted on a pot of the Yang-shao culture, Neolithic, ca. 4500 B.C., China; *b*, etched on the base of a bronze vessel, Western Chou period, 1122–1011 B.C., China. Lunar symbolism is suggested by the fourteen repeating motifs decorating the circular body. Lunar or solar symbolism or both simultaneously may also be implicit in the circumferential stylized rays, since portrayals of the "crossing" of the sun and moon (as two intertwined, half-serpent, half-human figures) are known in Chinese art of later periods, especially Han mortuary monuments.

significance is unknown. In the dynastic period the symbolism attached to it was clearly neither calendrical, as in China, nor philosophical, as in India, nor (as is assumed by some) indicative of rejuvenation and the "continuity of life," as in ancient Mesopotamia. The ouroboros in Egypt about the first millennium B.C. was largely symbolic of the underworld. Employed talismanically, it represented Apopis, the fearsome personification of evil and danger. The curse "O Apopis . . . you are annihilated. With tail in your mouth, you have consumed yourself"[110] might well be an apotropaism that befits the theme of Bes treading upon the ouroboros exemplified in figure 35. It was customary for Egyptian sorcerers conjuring the downfall of an enemy to draw an ouroboros with its head pointed towards the ground. The art of the strongly serpent-venerating Dahomeans of Africa makes exuberant use of the ouroboros motif in portrayals of their major divinity, Dâ.[111]

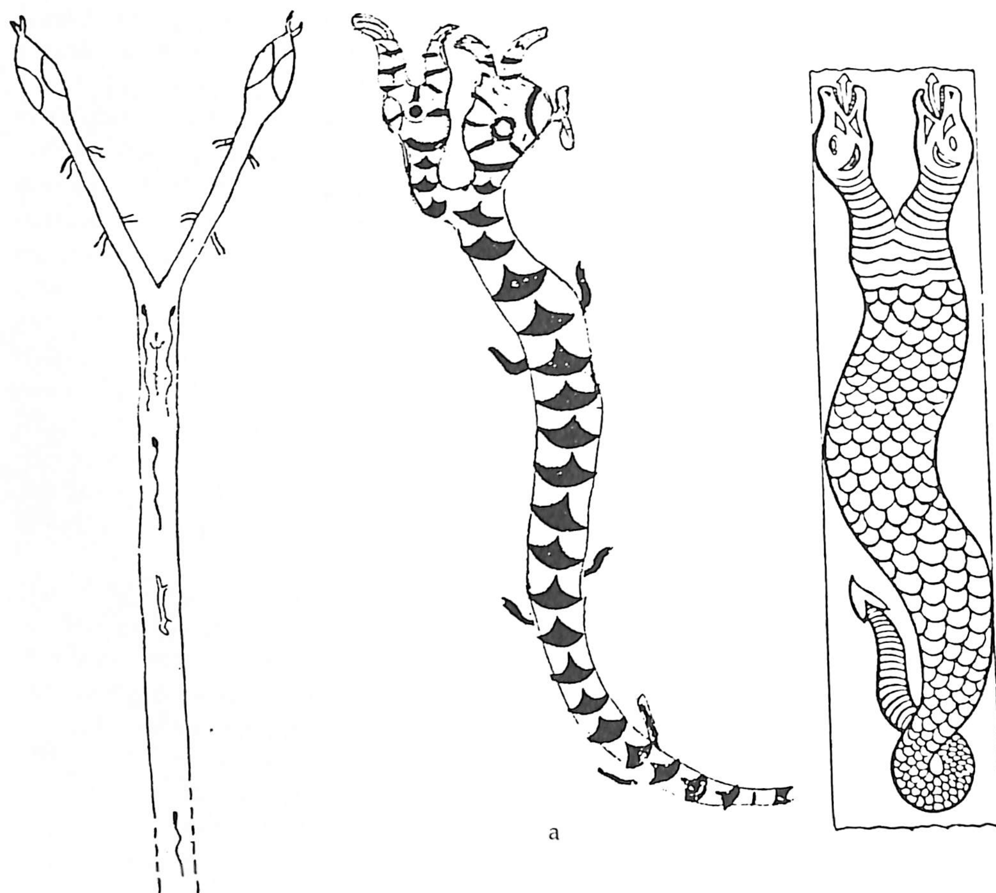
The popularity of this motif in the ornamentation and jewelry of many peoples worldwide needs no elaboration, but it is doubtful that it signifies anything more profound than that use is made of a well-known animal whose body form is as eminently appropriate for purely decorative purposes as for esoteric ones. It is therefore proper to mention, without pressing the argument against it until the concluding chapter, the facile claim of some psychoanalytic psychologists that the ouroboros is a fantasy image so primordial that it provides "the foundation [for] constructing . . . a unique history of the evolution of conscious-

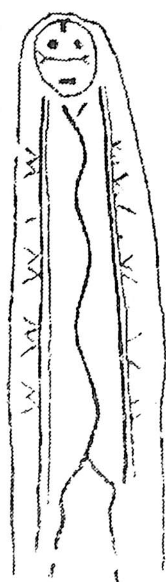
ness, and at the same time representing the body of myths as the phenomenology of this same evolution [as well as] conclusions and insights which are among the most important ever to be reached [in the field of depth psychology]."[112]

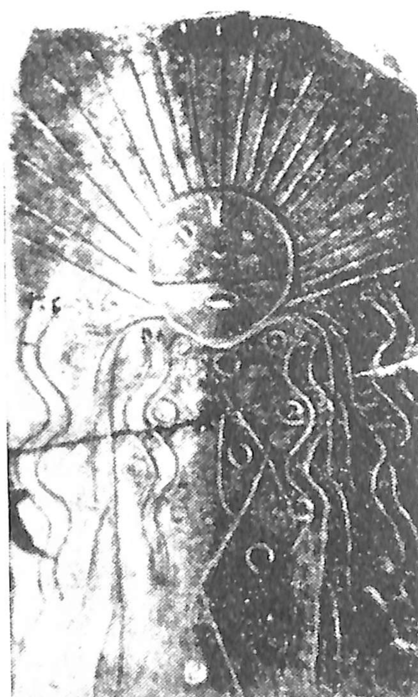
No animal commonly encountered, certainly no vertebrate, has a body form as simple as the serpent's. Even the invertebrates that most closely resemble it—centipedes and millipedes, some of which can be quite large—have external mouth parts, segmented bodies, and a prominent array of locomotive appendages. A serpent's head differs little in diameter, shape, and coloration from the rest of its body. Even its tail is almost imperceptible. Thus any aberration of this simple form, such as dichotomy of anterior or posterior extremeties, becomes conspicuous. P. Murphy[113] described a "very fine specimen of a krait" in which only the tenth and eleventh subcaudals, counted from the anal end, were dichotomous. Wall[114] records an aberrant doubling of the cephalic and caudal extremities resulting in two vertebral columns, each with its distinct set of ribs and organs. Two-tailed serpents are not unknown. Two-headed serpents are "surprisingly common" in some regions, a well-known herpetological fact that is occasionally publicized in the daily newspapers.[115]

Such genetic aberrations surely were observed by primitive man, but even if they were imagined they have been accorded a place in the cultic sentiments of innumerable societies: The Siberian Altai shaman's robes have sewn on them ribbons cut in the shape of serpents with gaping mouths and bifid tongues. The larger representations have their tail ends bifurcated. Sometimes three bodies share a head or two heads share a body (fig. 40*a*). The extraordinary popularity of serpent motifs in recent Siberian folk art and the cultic use made of them are discussed in much detail by S. V. Ivanov.[116] It is significant that such representations have a parallel in the monolithic obelisks, excavated by A. N. Lipskii in the Central Yenisei River basin of Siberia, dated to the Upper Palaeolithic.[117] On one of these is engraved a simple representation of a human face attached to an extremely slender, sinuous body that bifurcates at the lower end so as to simulate a standing person lacking arms and feet but having two short "legs" (fig. 40*b*). There can be little doubt that these slender lines represent a serpent with anterior dichotomy, since another stone monument of the same period and from a related site in the region portrays the normal form naturalistically. In view of the many references made so far to conjoint conceptualizations of sun and serpent in religious traditions, a brief digression may be made regarding the especially interesting cult relic of figure 40*c*. It shows a human figure, perhaps that of a deity or a shaman, with a bifid tongue emblem on its forehead. Towards the sun-face of this personage leap four serpents—two flanking the body and two inscribed over it—four being the "magic" number which many cultures link with the cardinal directions. Ophidian and solar traditions survived strongly until recent times among many Siberian tribes: According to Yakut tradition the body of their "very first shaman" consisted of a mass of serpents.[118] The Evenki (Tungus) shaman, who may employ a serpent "helper-spirit," imitates the animal's sinuous movements during his séance. In an Evenki chant, the line "the serpent—my ancestress" occurs twice, followed by a pause before the shaman turns around "according to the course of the sun."[119]

Images of axially dichotomous serpents are common enough in the art and mythologies of ancient civilizations that they need not be documented in detail (fig. 41). A two-headed creature figures in a Mesopotamian cylinder seal as early


a


b


c

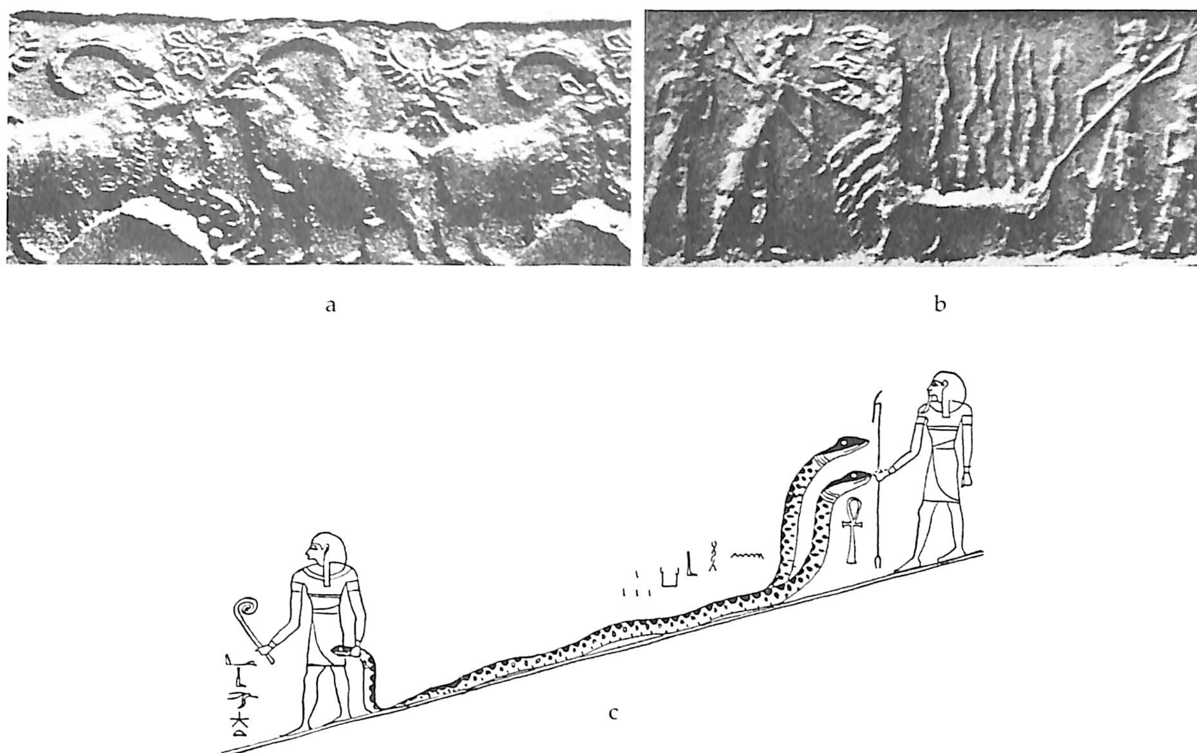


Fig. 41. Abnormal serpent forms: *a,* Sumerian cylinder-seal impression of a natural, two-headed serpent between a pair of caprids. Ophidian and caprine symbols have a definite religious meaning in relation to agricultural fertility and the god Tammuz in later traditions presaged by this seal of the Uruk period (earlier than 3000 B.C.); *b,* fantastic seven-headed monster (bifid tongues are distinct in the three upper heads) subdued by the "Lord of Vegetation," Dynasty of Akkad, ca. 2500 B.C.; *c,* the Egyptian god Nehebkau, who, as a double-headed serpent with a third head at the tail end, "is in this fashion at his abode of the water-flood, the holy road of Restau. He goeth to every place every day. . . ," from the Book of Am Duat.

as the fourth millennium B.C. In Hindu-Buddhist iconography, the half-human, half-serpent semidivinities—the *nāga* and *nāgiṇī*—are easily identified by their emblem, a canopy of three to seven fused cobra hoods. In Greece, at least one bronze image of a coiled serpent with two heads is linked with the cult of Zeus-Lýkaios, who, though in this particular aspect he was associated with wolves (as

Fig. 40. The serpent in modern and ancient Siberian shamanism: *a,* three examples of abnormal, two-headed mutants depicted in the ribbons and other decorations of contemporary shaman's robes; *b* and *c,* engravings on stone slabs linked to a solar cult of the Late Palaeolithic, Yenisei Valley. The face in *b* is divided horizontally by a line terminating in bifurcations at each end. It is also attached to a sinuous line (or body) with "legs" that prompt comparison with the objects in *a.* From the face of the personage on the stone slab *c* emanate sun's rays; the face is divided horizontally and has a distinct bifid mark on the forehead. Four serpents, two engraved on his body, two adjacent to it, perhaps connote the cardinal directions.

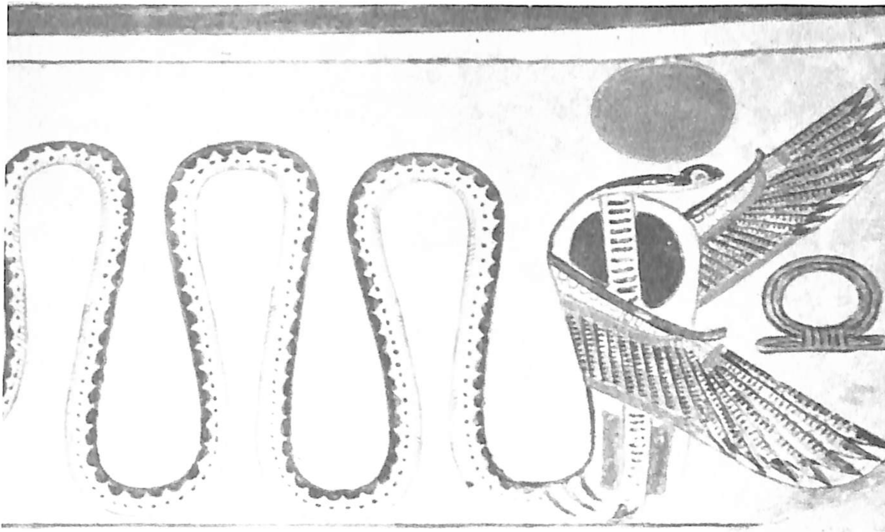
the epithet suggests), was "not essentially . . . a 'wolf'-god," but, more characteristically, ophidian.[120] Two-headed serpents occur frequently in Egyptian art. Portrayals of serpents with a head at each end of the body are, of course, purely creatures of imagination, common in the art of Western Hemispheric culture, for they have no natural prototypes. They are perhaps modeled, if at all, on species such as the earth boas, some of which have rounded, untapered tails.

The very simplicity of the serpent's form often provokes caricature of precisely those features the animal normally lacks. Feathered serpents are common in the religious mythology and art of innumerable primitive tribes throughout the Americas, while Kukulcan (of the Maya-Toltec) or Quetzalcoatl (of the Mexica), who had in addition to his fully anthropormorphic form a feathered ophidian alter ego, is perhaps the most widely known deity of pre-Columbian civilized Mesoamerica. "The viper and the fiery flying serpent" and lions are the only beasts of the Negev Desert mentioned in the Old Testament in an oracular context.[121] Herodotus wrote that "Arabian winged serpents do indeed seem to be many . . . and are nowhere else found,"[122] and in 671 B.C. Esarhaddon the Assyrian, marching across Arabia under duress to conquer Egypt, imagined seeing "reptiles that flapped their wings." In the religious art of ancient Egypt, a winged form is one of several variations characteristic of Mertseger, a manifestly ophidian goddess (fig. 42*a*).[123]

Normal horizontal, undulatory, sinusoidal or "serpentine" locomotion, which Klauber describes in detail,[124] is mechanically and physiologically one of the most interesting reptilian capacities, but the mental discomfiture it produces in most persons is equally remarkable. Progression by the formation of *vertical* loops in the manner of the inchworm or as depicted in printed illustrations of old travelers' yarns, is, however, a quite unusual aberration, though herpetologists like Wall[125] have described its occurrence in a cobra and in the Australian *Hoplocephalus pseudechis*. Klauber authenticates its occurrence in rattlesnakes. In the history of cults, it matters little whether or not the observation of such an abnormality in nature was actually the basis for fantasizing, for normal ophidian form and locomotion are, to many, eerie enough to trigger whimsical caricatures. There is at least one authentic early Spanish colonial account[126] of *metlapilcoatl*, a viper which, the Aztecs believed, could rear itself erect on its blunt tail and jump six to seven meters forward. They believed it to be not an animal but a *nahuri*, "demon."

Imagination endows the serpent with human feet, like those of Sito, the divine creature of Egyptian creation myth, a convention that can be traced back to Neolithic, predynastic times, when it appears as graffiti on rocks (fig. 43).[127]

We may conclude these examples of the expression of awe by noting one of the lesser-known oddities of ophidian behavior whose connection with man's fear of nighttime outdoor existence is obvious. Herpetologists have remarked that certain venomous species, among them the horned viper *(Aspis cerastes)* and copperhead *(Agkistrodon contortrix)*, are attracted by the heat or light of fire, presumably under certain seasonal conditions, apparently so compulsively that the animals are known to immolate themselves in campfires.[128] A popular Islamic zoological encyclopaedia asserts that they are "delighted by fire, which they seek, and are astonished by it." This curious attraction may not normally be a serious hazard, yet it is the subject of legend and art in Palau, one of the


a


b

Fig. 42. Feathered serpents: *a*, the Egyptian goddess Mertseger in one of her many forms, as a winged serpent with the solar disc above her; *b*, Quetzalcoatl, the plumed serpent deity of the Mexica.

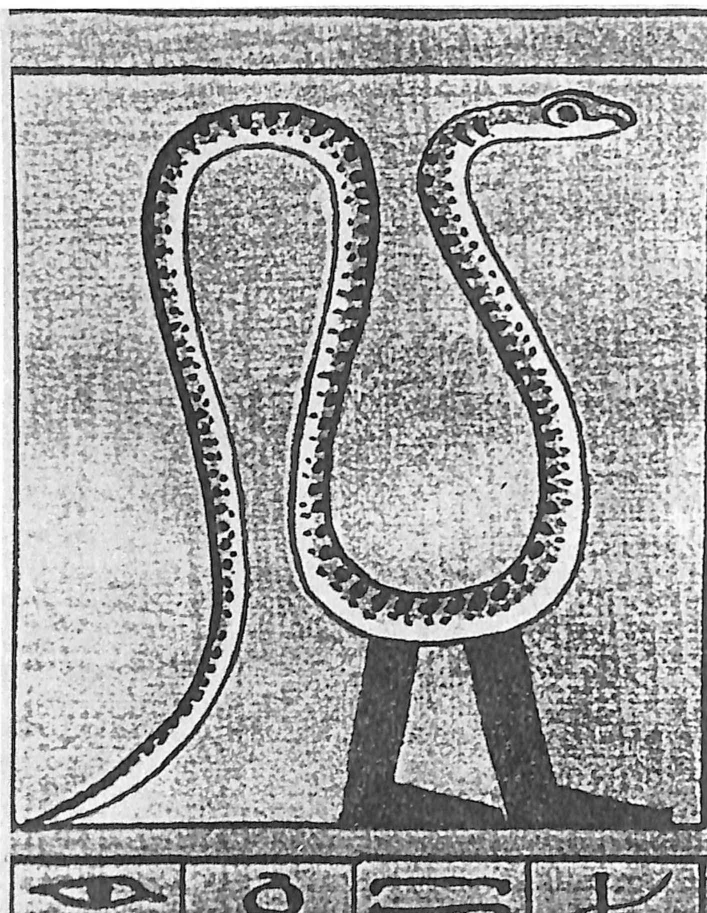


Fig. 43. Sito, the Primeval Serpent of the Egyptians, from the Papyrus of Ani, Early Nineteenth Dynasty, ca. 1300 B.C.

Caroline Islands in the Western Pacific. In the legend a man-eating serpent is irresistibly drawn to a village by its cooking fires and eventually killed by hot stones fed to it.[129]

Similar legends concerning this attraction perhaps occur elsewhere in the world, but they are probably much fewer than those that invoke the sun and employ the metaphor of fire. One of the daily perils of life in the valley of the Nile when the Egyptians of the Neolithic period were draining the swamps for agriculture was the cobra, a symbol adopted by the earliest pharaohs to symbolize their might and compel enemies to regard them with the same awe and terror as that incited by this creature. The priests who invented the legend of Re tell how this sun god was bitten by an asp lying in his path and how its burning venom raced through his body "like fire."[130] Myths the world over which give vent to anxieties about avoiding chance exposure to the twisting body, the fascinating gaze, and the fiery venom of the serpent are endless in variety. That man sometimes deliberately seeks out, caresses, and pays court to it is the measure of the extraordinary numinous power of this animal.

SERPENT-HANDLING SOCIETIES

It might seem that the awe that impels worship of a fully zoomorphic effigy of an ophidian deity could be strong enough to induce devotees to overcome inhibition and pay obeisance to an enshrined, live specimen. Serpents, after all, are easily procured, very convenient to maintain, and for the most part quite safe to handle. However, I know of no society whose members at large do this as nonchalantly as, say, a devout Hindu fondles a cow or an Ainu a captive bear—cult animals whose importance parallels the serpent's in these cultures. In practically all serpent-handling societies, intimacy of this kind is the preserve of the priest, the medicine man, the shaman, or the professional charmer. For instance, despite their strong traditions of ophiolatry, Brahman priests and most lay people never handle live serpents ritually but leave the task to specialists among the lower-caste Hindus. One may doubt, too (though there is no proof), that any but a few devotees ever had physical contact with the serpents ritually cudgelled and dissected at the altar of the mountain god Yüeh or of the deity "double-serpent" mentioned in the oracle inscriptions of Shang China.[131] On the other hand, during the Christian era of Egypt, members of the Gnostic Ophite sect (perhaps adhering to an ancestral custom) are known to have allowed their "sacred snake . . . to crawl all over the consecrated bread, which the worshippers then ate and afterwards kissed the serpent on the mouth."[132]

It is probable that the majority of ophiolatrous cultures that handled the live animal in ceremonies favored nonpoisonous species. In ancient Crete, Greece, and Cyprus, "house-snakes" or "temple-snakes" were carefully tended. Numerous objects of pottery, some with elaborately painted or molded serpent motifs, were specially designed in the form of tubes, platforms, and vessels which served as feeding stations or residences for the reptiles.[133] Some of these objects date to the Early Neolithic. It is of interest that spouted, perforated pottery vessels with moldings of serpents ascending their sides are also known from the site of the ancient Maṇiyār Maṭh, a serpent-worshipping center at Rajgir, India.[134] Pottery vessels that resemble the Cretan and Rajgir objects are also known from south-central Africa, the similarities being coincidental rather than the results of culture diffusion. The pottery of certain widely disparate ancient cultures is outstandingly decorated with designs that suggest that some of them may have had ophidian cult associations. The motifs from Neolithic mid-Jomon-period Japan,[135] the pre-Indus and Indus Valley cultures,[136] Elam,[137] and the pre-Cucuteni cultures of Rumania and others of contemporaneous Eastern Europe,[138] for example, are clearly more than ordinary embellishments if viewed against a background of the idols of their respective regions and periods. It is difficult, however, to conjecture whether the forebears of the very large number of modern cultures of the world whose art, religion, and mythology contain strong ophidian elements were indeed serpent-handlers, though some, such as the prehistoric Elamites and Dravidians, certainly were. It is probable that in most of the ophiolatrous cultures of antiquity, some of whose members may deliberately have handled poisonous species in religious ecstasy, the animals, more often than not, were defanged. Still, they provide eloquent testimony not so much to personal bravery as to the lengthy, unrecorded history of the chance acquisition of knowledge of the serpent's structural and behavioral peculiarities.

Even the initial flushing of a reptile from its hole and the manipulating of it immediately afterwards is a most hazardous skill requiring judicious estimation of the ecological and other factors that influence reptilian reactions.

In Sumeria, as early as the Fara (Shuruppak) period of the early third millennium B.C., Akkadian texts include *mušlaḫḫu* and *mušlaḫḫātu* (male and female "serpent-walkers" or "serpent-charmers") in lists of temple personnel, and variants of these words also occur in ancient Hebrew and Ugaritic incantations. Ugaritic inscriptions that mention the *mlhš* and the tricks of his trade give no details, but words like "extirpation" and "destruction" of the "scaly one's" venom are used with apparent relish.[139] The *mlḫš* knew how to subdue a cobra by clasping its tail, hypnotize the animal by gestures and rhythmic swaying, maintain positions and minimal distances to thwart unexpectedly swift strikes, and extract or sear its venom glands—skills that catered to, and originated in, religious zeal in Ugarit, though they are accident-prone even in modern serpentaria. The Egyptians and Hindus surely possessed similar skills, but details of their knowledge are not available. Even the Hindus, part of whose serpent lore is categorized as a special branch of learning, *sarpa vidyā,* are not explicit. One can, therefore, only draw inferences from records of modern cult practices.

Cobras are one among several deadly species that differ in behavior but whose individuals have one common characteristic: idiosyncratic temperament. The cobra's is as distinctive as its fearsome appearance, and together these may account for this animal's prominence in Hindu mythology. In the elaborate ceremonies of the important annual *nāgapancami* festival celebrated all over India, Hindus rarely venture to touch even the defanged cobras that are paraded from house to house for alms.[140] The region near the village of Shirala, in western India, is famous for the pomp and dramatic fervor of these ceremonies. The villagers seem to have learned by trial and error the conditions under which completely unharmed captive cobras may be handled safely—though they may attribute their freedom from attack to the kindness of Śiva, the god the cobras symbolize. "The children are taught to handle snakes from the earliest age, beginning with the non-venomous kind," writes H. Miller, "later graduating to cobras, learning that with gentleness, confidence, and skill they would be in no danger. . . . [we examined and found] the poison fangs intact. Yet never, throughout the day, did we see any of the hundreds of cobras attempting to strike their handlers."[141] There is need for more detailed investigation, but it is clear that natural causes rather than divine will favor the people of Shirala with a rather low risk of accident.

The *nāgapancami* festival occurs in August, coinciding with the recent emergence of hatchlings from their eggs, thus making the collection of cobras from their holes doubly risky. As Wall indicates in his detailed studies of the cobra's disposition and breeding habits, hatchlings and juveniles less than a year old (averaging 18.5 centimeters and 75 centimeters, respectively) are the most active, exceedingly dangerous, and "can scarcely be touched with impunity," though their striking range is less than that of a young adult and full-grown ones that range in length from 120 centimeters to 175 centimeters or more. The adults are also relatively less vicious; thus "it is certainly significant that no one sees a young cobra in the hands of a juggler. . . . [for it is] more on the alert, more easily excited, and strikes repeatedly and with much malice." However, "the cobra's

striking range is a very limited one. Erection of its forebody and expansion of hood and the height to which it can erect itself forms the radius of the stroke. . . . [this] is very deceptive, appearing much greater than it proves to be. . . . Jugglers estimate this range wonderfully from long practice and contrive to evade their captive's menace with remarkable precision, withdrawing their hands often only a few inches from the spot where the stroke is delivered."[142]

Now, it is significant that in Miller and Bedi's photographs cobras of juvenile size are scarcely in evidence except, possibly, in one remarkable picture showing four maidens motionless and prostrate in obeisance within striking range of a seemingly small, coiled individual threateningly poised for a strike. The villagers have learned, too, how all-absorbing movement is to the cobra. In Wall's words, "one has only to attract its attention with one hand, while you seize it in the *middle* of the body with the other, and the snake is yours. It strikes in every direction, especially at any moving object, but it never seems to occur to it to turn and bite the hand that is holding it as almost all other snakes would do almost at once."

In Myingyan district of Burma, the location of Mount Popa, whose reptile-infested slopes have for centuries been regarded as the haunts of *nats* (supernatural spirits, generally evil if not propitiated), certain families of snake charmers exhibit a reverential zeal that is as noteworthy as their derring-do: They normally keep a king cobra *(Ophiophagus hannah)* for no more than a year after its capture but release this large, very deadly animal in its original jungle—a symbolic gesture of giving it freedom, thereby expecting immunity from snakebites in the future. Their skill is evident in photographs of a girl approaching an unmutilated, full-fanged king cobra measuring over 4 meters in length and poised for a strike, then "kissing its raised head and allowing its tongue to play over her face . . . with nothing more in the act than self-confidence, nerve and a knowledge of snakes."[143] A scientific explanation of her success, however, is impossible because of a lack of sufficiently detailed information.

At any rate, knowledge of the cobra's ways is of limited value when subduing the more refractory viper (though Wall's remark about the efficacy of holding a cobra by its middle applies equally to the viper), whose temperament and posture preparatory to a strike are quite different. The Babylonian incantation "viper, the serpent that cannot be conjured,"[144] appears to have been belied in ancient Elam, which had historical and artistic ties with neighboring Babylonia. An inscribed Elamite amulet, for instance, depicts a *labartu* or apprentice priest ("bien gravée sur pierre noire dans le style babylonien") dancing with a serpent, presumably a viper, judging from the markedly triangular shape of its head (fig. 44*a*). This shape is encountered in numerous other relics, including painted pottery and stamp seals of a quite early period (fig. 44*b,c*). Apparently, Elamite religious practices (known to have included strong ophiolatrous elements) involved nudity. These features are evident in Elamite relics such as a carving in bitumen (fig. 44*e*) and the seal impression in fig. 44*d*, which, according to Walther Hinz, represents priests standing in pairs either naked or with "loincloths" in the form of serpents.[145] Whether or not these and other Elamite relics as a rule depict vipers is not always clear. However, an unusual photograph illustrating the festival of dates in present-day Yemen clearly shows a conjurer of the Zaranig tribe "swallowing" from their tail ends, simultaneously, five horned



Fig. 44. Ancient Elamite art: *a*, amulet with inscription on one face, the other depicting a *labartu* or apprentice priest holding a serpent with arrow-shaped head, probably a viper; dating uncertain; *b* and *c*, black steatite stamp seals, late fourth or early third millennium B.C., portraying a bearded, partly human, partly cervid personage who may be the "lord of beasts" or a priest or hunter reflecting the cult of the goddess Murkum (the provider of wild game), standing between two huge serpents with arrow-shaped heads, and, in *c*, assuming ("sans conteste," according to Amiet) the body of a serpent; *d*, cylinder-seal impression showing pairs of naked priests, some of whom seem to be carrying serpents over their hips, ca. 2300 B.C.; *e*, ouroboros between two naked priests, sculptured in bitumen, Susa B, ca. 3500 B.C.

vipers, a deadly nocturnally active species of the Arabian Peninsula. The "feat," which occurred in the glaring direct sun, almost surely must have dulled the vipers' aggressiveness, and it is possible that they were also defanged.[146]

The New World rattlesnakes, with their structurally highly specialized dentition, venom apparatus, and sensory capacities, are among the most dangerous of vipers yet the cult species of choice throughout most of the Americas, just as the cobra is in Egypt, India, and Southeast Asia. The rites of the Aztecs, Tahue, Tarahumara, and Hopi, all of whom, as members of the Uto-Aztecan linguistic family, perhaps shared certain ophidian traditions with a few other Mesoamerican cultures, almost certainly included the handling of vipers by specialists, but how intimately and on what occasions we do not know. Castañeda de Nacera wrote in 1540 that the Tahue of Culiacan were "accustomed to keep very large serpents, which they venerate."[147]

The Hopi of the southwestern United States provide perhaps the most vivid example of a people that handled full-fanged rattlesnakes with an abandon befitting the literal meaning of the word "conjure": they produced magical effects by natural means, i.e., except on rare occasions they evaded death from accidental bites more because of observance of age-old ritual procedures than by rationale. The reasons for their success will be apparent below, but it is important first of all to summarize their practices from the colorfully authentic, accurate and very detailed observations and photographs made (despite Hopi resentment) at the beginning of this century, before the rituals had lost their original spiritual aura through increasing contact with tourists.[148] There were two high points of danger from bites during these annual rainmaking ceremonies, which extended over a fortnight—the initial four-day hunt for reptiles and the climactic, frenzied dances in which the clan "priests" held them in their mouths. The events during the interim were not devoid of risks (for captive rattlesnakes, like others, can never be fully tamed into docility, though their aggressiveness may be dulled)—risks that aid one's appreciation of the reasons countless centuries may have elapsed before normal human fear was balanced first by a *sacral* desire to handle rattlesnakes and then by skill in warding off their attacks. The Hopi ceremonies were held in August, but it is impossible to correlate this period with the temperament and disposition of rattlesnakes.[149] The Hopi collected several species indiscriminately, surely knowing that all ophidian behavior is unpredictable, though the seasons, breeding habits, nocturnal versus diurnal activity, age, and sex modify ophidian temperament from month to month, depending on the species. They chewed roots and used the extract of a cruciferous plant called *hohóyaonga (Lesquerella cinerea)* in the naive belief that it would both help ward off bites and serve as antidote for venom to the extent that it was accorded high ritual value.[150] The rattlesnakes were never "willfully" harmed, according to their captors, for they regarded them as "sacred brothers"; but it will be evident that this sentiment was consistently if unconscionably violated by rough treatment in one form or another that produced subtle physical effects in the animals.

The rattlesnakes, in their most aggressive mood when first encountered by groups of three or four completely naked priests, freely admitting fear of bites though they were smeared with *hohóyaonga* paste, were collected with great skill. The principal ingredient of success lay in inducing the cornered reptile to loosen its striking coil—the characteristic threatening posture in which the head is

elevated along with two or three zigzags, or incomplete spirals, formed by the forepart of the completely coiled body, with the tail pricked up, before the serpent lunges forward to bite. Klauber writes that the rattlesnake strikes "so fast, indeed, that the motion of the head cannot be followed by the eye." The Hopi normally induced loosening of the striking coil with a traditional ritual tool, a stick with two long feathers attached to it, distracted the animal's attention, and then seized it in the *middle* with the right hand and also just behind the head with the left. Immediately afterward they spat on the right hand and slowly stroked the animal full length—an act surely calculated to stretch its vertebral column and nerve cord harshly,[151] for the rattlesnake "soon hung as limp as a rope" and was then put into a buckskin bag. The practice of using a feathered stick or "whip" to discourage the striking coil was standard at all times, including the final dance, days later.

Each dancer held a rattlesnake in his mouth just behind the head or, in his mouth or hand, around the middle of its body, but the animal was intentionally dropped "every few minutes to get another one. It was picked up by another man in the group, held in the mouth and rhythmically swayed side to side to the stomping of feet, swaying of torso and bending movements of the dancer before he dropped it for another man to pick up. . . . None seem to be more reckless in handling the snakes [during the pre-dance ceremonies] than the smaller boys." The reptiles had many opportunities to attack during these extended ceremonies, but "a rattlesnake, already coiled up and ready to fight, even the most experienced priest will not touch until he had induced it to uncoil. It is astonishing, however, with what complete unconcern the dancers will move about among the snakes that are being constantly dropped even if they are coiled up and apparently ready to strike at the foot or leg of the man who passes in close proximity."

The pre-dance rituals were of extended duration and of no less significance for understanding the basis of this recklessness: Immediately after being collected in the wild, the rattlesnakes, generally over a hundred of them, were brought to the kiva, a large underground ceremonial chamber with sand paintings on the floor and other religious appurtenances, and "flung down violently on to the first sand picture so that the drawing is obliterated [and, since the drawing depicts four zigzag serpents of the cardinal directions, to symbolize lightning] . . . there is no doubt that this magic throw is intended to make the snakes provoke the lightning or bring rain."

The rattlesnakes were guarded by small boys, many of them about nine years of age; the youngest, naked like the others, writes J. W. Fewkes, "held his place without shrinking, even when the rattlesnakes crawled near him, an exhibition of infantile pluck which I have never seen excelled. This is not simply want of fear through ignorance, for again and again in their songs and talks the priests pray that they may not be bitten." The reptiles were tossed constantly 4 to 5 feet to keep them in their corner of the kiva every time they crept away from it. The boys "played with their feathered whips or naked hands, permitting them to crawl over and under their feet and between the legs, paying no more attention to the rattlesnakes than to the smallest, harmless whip-snake, forming a sight never to be forgotten." Again, they were generally manipulated by the middle of their bodies, and there was further tossing after the ceremonial washing of the serpents in bowls of water containing *hohóyaonga* roots. These young

gatherers often "held 4 or 5 or even more snakes in their hands," but someone nearby was always on the alert with a feathered whip to distract and prevent them from assuming a striking coil. In addition, they were "constantly put in and taken out of buckskin bags" and then crowded into earthenware jars "hermetically sealed with mortar. When it is borne in mind that the snakes are piled one of top of each other in this small inclosure it is almost incomprehensible that they do not suffocate. . . . With so many reptiles handled in so many different ways, and often by young inexperienced boys, it is certainly astonishing that not more snakebites occur than is really the case," wrote H. R. Voth.[152] But is it really?

That bites occasionally did occur despite the rough treatment is a tribute to the resiliency of the rattlesnake. That its ferocity can be stifled reflects upon the ease with which a few tricks of the trade affect the physiology of an animal whose cold-bloodedness makes it extraordinarily sensitive to changes in its physical environment; whose primitive brain and nervous system and bodily structure inadequately equip it for flight from man; and whose voicelessness cannot betray the torment its well-intentioned devotees inflict upon it. Does this not at the same time reflect upon the power of religious beliefs that sometimes prompt man to learn, even if only by rote, to prevent venomous bites, the serpent's only effective weapon?

It is easy enough to understand why confinement in containers, often in the direct sun, bodily abuse, and the undoing of a serpent's striking posture by distracting the animal in a particular way are effective devices in charming, but it is less clear why gripping it (particularly in the cases of cobra and viper) by the middle section (logic would guide most people to grip the neck) is effective for prolonged ritual handling, though its underlying neurological basis is unknowingly exploited. The serpent-handling practices (now banned) of the Free Pentecostal Holiness Church in the rural southeastern United States are vivid in photographs of a zealous participant described thus: He "held a rattlesnake [venom gland and fangs intact; about 1¼ meters long] by the mid-trunk region as he stomped around the congregation. . . . the reptile hung limply cataleptic and showed no response until the worshipper paused and became silent for a few seconds [when] it began to wiggle, writhe and ominously rattle," yet "the particular minister who was never bitten in '2,000 experiences' said he quaked in terror on seeing or handling harmless garter snakes or black snakes when he was not in a trance."[153] "A particularly admired gambit is to grasp the snake about mid-body and then raise it slowly until the flickering tongue touches the nose of the worshipper, who meanwhile stares intently into the snake's eyes."[154]

A scientific explanation of how snakebite may be averted despite prolonged manipulation of a potentially lethal species is suggested by Domin Svorad's researches on Totstellreflex or "animal hypnosis."[155] This phenomenon involves disturbance of an animal's spatial orientation under certain conditions which are particularly relevant in view of the almost ceaseless jostling, tossing, overturning, or rhythmic swaying to which it is subjected by those who handle it intimately as a ritual object. Svorad investigated the peculiarities of simple, repeated mechanical movements as stimuli affecting the neocortical part of the brains of representatives of those classes of vertebrates which possess the neocortex, i.e., beginning at the phylogenetically lowest level in which its primi-

tive organization is first clearly discernible, that of the reptiles. To validate his experiments, he compared lizards, cocks, rabbits, rats (lower mammals), and cats (higher mammals), using electroencephalographic criteria and an apparatus to rotate them about the vertebral axis from the zero position of Magnus to 180 degrees. His object was to determine the time required to induce in each animal a condition electroencephalographically more or less equivalent to natural sleep and the time needed to break this comatose condition. Arousal from this induced stupor or lethargy was effected by labyrinthine, galvanic, caloric, mechanical, olfactory, visual, and acoustic stimuli. Svorad found that intense labyrinthine stimulus such as sudden and rapid rotation of an animal evokes "an inhibitory process [originating in the subcortical regions of the brain] which spreads into the entire hemispheres. It is therefore more appropriate to call this phenomenon by a physiological name—paroxysmal inhibition." Svorad found, too, that the mammals were forced into this state less easily and, as compared to the lizard and the cock, were also artificially aroused from it by noise, movement, or other stimuli with less difficulty. Duration of stupor was also longest in the lizard and the bird. Rotation of lizards merely ten times produced a comatose condition which lasted an average of eighteen to twenty-five minutes until they regained equilibrium naturally.

One may assume that the conditions used by Svorad to induce stupor, being scientific in design, are more efficient than might be simulated in serpent handling during cult practices, but the effects on an animal are in principle akin, and the physiological and anatomical characteristics of lizards and serpents are so alike that paroxysmal inhibition of normally aggressive ophidian behavior is probably what serpent handlers often depend upon, unconsciously, in their most daringly intimate moments. Still, this factor is only one of several that impel them to exalt and venerate the serpent—or calumniate it, as some Free Pentecostal Holiness Church members formerly did in taunting defiance of an animal they regarded as the devil incarnate.[156]

The tricks of subjugating a serpent—be it harmless or venomous—are simple, often reliable, and easily learned by observing an expert conjurer. They need not be the monopoly of a select few in any culture. The fact remains that throughout the world where ophidian deities are, or once were, revered, few people are likely to feel at ease even at the thought of the conjuring by a Sumerian *mušlaḫḫu*, a Hopi priest, or a Shirala villager of the odious serpent into a congenial, numinous companion.

CHAPTER 3

The Cult of the Serpent Amidst Other Animal Cults

Though it is apt to be stereotyped as more loathsome and malefic than most other species, the serpent monopolizes no particular supernatural trait or symbolic role. In mythology, there are winged bulls and lions; the wolf's potential for evil matches the serpent's; the bear, bull, hare, hippopotamus, and pomegranate (to include one plant as example) serve as emblems of fertility; the fox may symbolize craftiness; insects may presage rain; and so on. It is often difficult to ascertain on the basis of folklore which species a society regards as the "most awesome." The Cubeo of the Amazon Basin and the Paiwan of Taiwan, like many others who revere serpents, claim descent from the anaconda and the deadly venomous *Agkistrodon acutus*,[1] respectively. Several cultures of Southeast Asia, Africa, and North America claim descent from melon, gourd, or pumpkin seeds [2] but, like the Cubeo and Paiwan, regard the serpent as highly numinous. Clearly, religious convictions involving an animal are often separated by only a thin line from the significances simultaneously attached to others in myth and

legend. In addition, the obscurities of logic in "primitive thought"[3] impede estimation of relative symbolic values among peoples who lack writing. On the other hand, the continued significance attached to a particular species during hundreds of centuries in the religious beliefs of ancient civilized peoples and their descendants is often unambiguous in their literature or apparent in their art and a useful measure of that species's appeal to man's imagination and mundane concerns. One may, therefore, suggest if not prove by ethnographic analogy that certain persistent sentiments have had extremely early, even prehistoric origins, at least for circumscribed groups of societies with cultural or temporal continuities among themselves.

Are there cultural evidences that man has given extraordinary attention to the serpent as a numinous creature? I will assert at the outset that there are: (1) Certain invertebrates, though eminently comparable to it with respect to venomousness, habits, appearance, or the nature of their depredations, incite scant religious symbolism in contrast to birds and mammals. (2) The serpent appears with remarkable constancy both in solo roles and in the company of *particular* local species that figure in religious thought. (3) Portrayals of it, naturalistic, stylized, or chimerical, on accessories used in ritual—icons, pottery, vestments, etc.—culminate in anthropomorphic images of dieties whose ophidian qualities are pronounced. (4) Even cultures whose regional faunas are deficient in reptiles stress or retain vestiges of ophidian traditions. These have much theoretical bearing on a point of psychological interest addressed in the concluding chapter of this book—that while almost any species familiar to man has the potential of appealing to his whim and becoming a numen, he tends to hold strongly in awe only one or two. We shall consider these four criteria in the following comparisons, concentrating on a few representative groups of animals that are pertinent to a discussion of cultic beliefs.

THE INVERTEBRATES

Among the invertebrates which zoologists usually regard as dangerous to man, the Arthropoda—spiders, centipedes and millipedes, and scorpions—are forms whose behavioral qualities are comparable with those of serpents. They fall into primitive man's "taxonomic" category of creeping things, are voiceless and attack silently, have exceedingly dangerous representatives, share the serpent's habitat, and invade human dwellings in large areas of the world. The first three animals can be disposed of easily. The number of fatalities they cause hardly compares with that from snakebites, but several species among them inflict extremely painful stings or bites. Their neurotoxic venom may cause anaphylactic shock and even death.

About spiders, Roger A. Caras writes that, in general, their "power to give people the creeps is second only perhaps to snakes. They are feared and hated far beyond their power to do harm," though some are dangerous and pestilential enough to have necessitated the production of antivenin.[4] In southern Europe during the Middle Ages, tarantism—hysteria incited by the "emotional contagion of the fear of spider bites"—was a mass anxiety reaction whose etiology of "symbolism, ambivalence, displacement, phobia formation, and other ego defenses of individual tarantists plus the psychodynamics [impelled them to] group themselves together" to dance to music "as the only effective cure." H.

F. Gloyne, who describes the "spider scare" as "fabulous in the extent of its incidence, morbidity, and mortality," gives a vivid account of the distress aroused by tarantism, if not by actual bites of the large formidable tarantula—an animal which, nevertheless, is obscure in both secular and divine symbolism.[5] In Mexico, species of tarantula and the tiny *casampulga* are venomous enough (see table 4) to have drawn comment from colonial chroniclers such as Clavijero and Sahagún,[6] but the spider was a symbol of none of the deities of pre-Columbian Mexico.

In tropical Asia, particularly India, Burma, and Malaysia, centipedes may attain lengths of almost 30 centimeters and look much like small serpents. In the dry season, many species burrow deeply. Their bites can be very severe, keeping victims bedridden for up to three months. Symptoms produced by a Malayan species are said to be more spectacular than those produced by the venom of some vipers. In some parts of China, as we have seen, yellow paint was customarily daubed on children's legs as a charm against both centipedes and serpents, but in myth and cult the latter species completely overshadows the former.[7] The ancient Egyptians honored centipedes of the genus *Sepa* "more as an animal of the earth than as a poisonous animal" and even gave this "insignificant animal" a certain importance through a cult center near Roda. Though linked locally with the Osiris cult, it was never elevated to the level of their ophidian deities or used as any divinity's alter ego.[8] Millipedes are not venomous, but some of them secrete hydrocyanic acid, which causes a skin rash and even blindness. In general, spiders, centipedes, and millipedes can be disconcerting if not downright dangerous. One might expect deities to be modeled on them, but I am not aware of any in either civilized or primitive societies.

The scorpions are quite another story. Very widely distributed in the warmer countries of the world, but mostly in their drier regions, they are no less insidious than the serpent. They are, like some of the latter, largely nocturnal and gain access easily into man's dwellings, and many species are extremely venomous. They can resist the sun's heat very well and infest the land densely. Caras describes swarms in Angola with individuals occurring every few feet.[9] They exhibit a prolonged premating dance during which a couple cavorts back and forth with arched tails. After copulation, the female may devour her partner. The progeny may be so numerous that they conceal the mother's back, to which they attach themselves for about two weeks. Scorpions are terrestrial, "taxonomic anomalies," their powerful pedipalpi with pincer-like claws giving them the appearance of aquatic crustaceans such as crayfish, crabs, or lobsters. Some genera, such as *Heterometrus*, produce warning sounds "similar to the hissing produced by rubbing the flat part of a comb against a stiff brush." Scorpion stings are neurotoxic or hemolytic, depending on the species, and vary in effect from extremely painful to fatal, with death ensuing within forty-five minutes to fifteen hours after symptoms that closely resemble those of snakebite. Scorpions are indeed *bons à penser*, particularly in view of the fact that the geographical distribution of reptiles overlaps the scorpion's. Yet, on the whole, the scorpion has not excited man's fantasies nearly as much as the serpent.

Throughout Mexico, as I have shown in chapter 2, the annual mortality from scorpion stings is nearly ten times that from snakebites. It is remarkable, therefore, that its mythic significance hardly compares with the serpent's. A detailed study of Tzeltal Maya folk notions of zoological classification has

yielded data occasioning only a brief paragraph on the scorpion.[10] In the Mayan Codex Madrid, the scorpion has a minor association with the deer, an animal involved in soil fertility symbolism and in sacrifices. However, the more usual or characteristic elements in this case are the serpent, the deer, and water.[11] The Huichol Indians had a minor deity called "La Toruca" with scorpioid attributes. The Nahuatl word for scorpion, *colotl*, literally means "monster," yet, among the Aztecs of the Mexican plateau and among the ancient Yucatec Maya the scorpion symbolized merely the human hand. By contrast, the Mayan name Chicchan signified an important group of monstrous, mythic celestial serpents that occupied the four cardinal points and sent rain and whose fearsome shouts were heard as thunder.[12] The major deities of pre-Columbian Mexico are ophidian, not scorpioid.[13] This is reflected in the profusion of serpent motifs and the infrequency of scorpion motifs in archaeological relics.[14] Scorpions have no role in the symbolism of Mesoamerican religious calendars.

In Hindu calendrical symbolism and religious art, too, the scorpion is eclipsed by the serpent. Not a single one of the extensive assemblage of Hindu deities is emblematized by the scorpion. On the other hand, the Islamic Hadith contains many references to it, though they are rather less ambivalent than those to the serpent. Muhammad is said to have prayed for refuge from destruction and death, from burning and drowning, from Satan, and, specifically, from scorpion- and snakebites, all in the same breath (fig. 45).[15] The pre-Islamic Arabs worshipped at least three ophidian deities—Wadd, Naḥastāb, and Saḥar—but the few idols known to have had clear animal associations include none that is scorpioid.[16]

Only in ancient Egypt, and perhaps more so in Mesopotamia, do scorpions assume an importance, rivaling, though hardly supplanting, the serpent's. The Egyptians had at least thirteen major ophidian deities,[17] whereas their only major scorpioid deity, besides two minor ones, was the goddess Selket. She protected wayfarers against scorpions but, ironically, was known as "the mother of serpents" whenever she substituted for Nephthys as consort of the antigod Seth.[18] A huge sculpture of Selket in black granite with a clear identification inscribed on it is not in the form of a scorpion, but in that of a rearing cobra.[19] This may not seem surprising, since the Egyptians sometimes cast one zoomorphic deity in the guise of another. Nevertheless, two exhaustive iconographic treatises[20] on the primarily ophidian goddesses Renenutet and Mertseger do not mention their scorpion aspect—if indeed they possessed one.

In Wolfgang Heimpel's compilation of Sumerian cuneiform inscriptions that invoke a variety of animals in divine contexts—a representative sample of the corpus—there are only three texts related to *gir*, "scorpion," versus seventy-seven related to *muš*, "serpent," though both animals were a scourge in Mesopotamia.[21] Ishara, a goddess of the Assyrio-Babylonian pantheon, had the scorpion as an attribute, but this was replaced by the serpent when she was addressed as Shala.[22] Other important Mesopotamian deities with scorpion attributes include the important Ningishzida and Ishtar, but their primary symbols were, in the former's case, serpents and, in the latter's, serpents and doves (besides other less prominent animal symbols). In later Semitic traditions, the Canaanite god Ṣidia Babi (Sed, Shadrafa) seems to have had a scorpion as an attribute besides his obviously more characteristic ophidian one. He is thought to be the precursor of Ched, an Egyptian god worshipped during the eighteenth

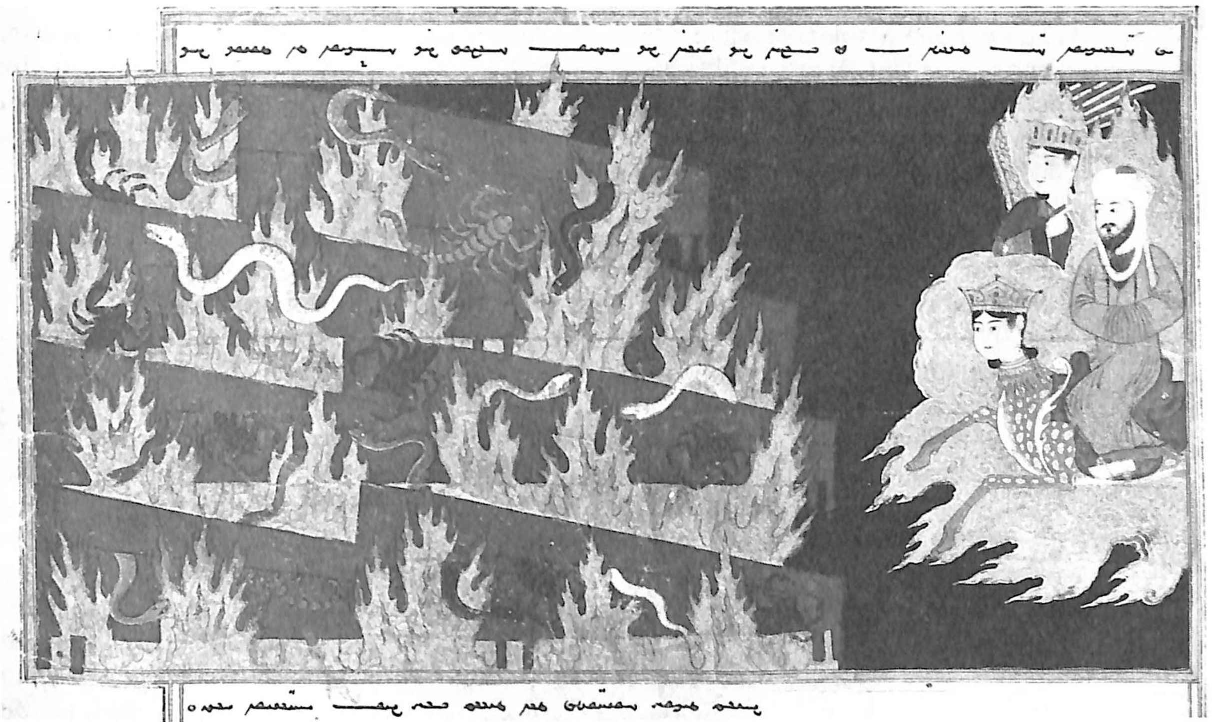


Fig. 45. The Prophet Muhammad on his celestial horse, Burāk, watching the incineration of serpents and scorpions in hell's flames, from the *Mi'rāj Nāmeh*, (A.D. 1436), an eastern Turkish manuscript in the Uighur script.

and subsequent dynasties as a protector of wayfarers against serpents and scorpions, which jointly symbolized him.[23]

In a comparative survey of Near Eastern archaeological monuments that portray various species of animals alongside scorpions, Waldemar Déonna concludes that the most frequent association is that of the scorpion and the serpent.[24] Nevertheless, it will eventually be apparent that the serpent is entirely dissociated from the scorpion to emerge as the preferred symbol in certain important annual rites of the Mesopotamians and in Mesopotamian and Egyptian creation myths.

AVES

The bird is far and away the animal most commonly paired with the serpent in an oppositional sense—a not unexpected circumstance, for the bird has no aerial rivals for attention except the bat and the insect. (The habits, hair, and other features of the bat clearly distinguish it from birds, and an exceptional case of its veneration deserves separate comment because it obtrudes upon man's attention so much less often.) The generally cryptic habits and voicelessness of serpents make them the very opposite of the bird, especially since the latter's warm-bloodedness enables it to colonize and draw attention to itself in cold regions that are inhospitable to serpents. It would seem that almost every soci-

ety attaches a solar significance to the larger birds, such as eagles and hawks, whose soaring flight easily suggests this.[25] Yet, the biological qualities of the bird—irrespective of species—provide little food for symbolic thought. Its chief characteristic, flight, is antithetically emblematic of traits that are primarily the serpent's, whose subterranean domain, venom, and fertility and pluvial symbolism it does not ordinarily share, though instances of its sharing with the serpent its own solar symbolism are very many. In striking contrast, too, the diurnal activity of almost all species of birds precludes major lunar or astral significances. Feathered serpents are unknown in Hindu iconography.

As a *deity*, whether malignant or benign, the serpent figures more frequently than the bird, and surely more powerfully, since it very commonly emerges in cult *independently*. Yet it is also paired with birds complementarily, i.e., in metaphoric opposition, in myths and rituals which give an important role to the bird—and all this despite the fact that the bird has practically no celestial rivals vying for attention while the serpent has many terrestrial ones. In these senses the bird is subordinate to the serpent in human thought. Indeed, its frequent portrayal as an enemy of serpents (actually, raptorial birds like the eagle feed on rodents and other small mammals no less voraciously) only redounds to the revulsion that reptiles normally arouse in man. Religious traditions in which the bird is the less significative partner in binary pairings with the serpent, in my experience, easily outnumber the reverse. At one extreme the two animals may be symbolically united to the extent of fusing them corporeally in works of art; at the other, they are represented as mutually antagonistic, with the serpent usually looked upon disdainfully.

In the religion of the Ngaju Dayak of Kalimantan (Borneo), the water serpent and the hornbill are separate, if interchangeable, supreme deities and equally venerated. However, the Dayak creation myth, which opens with the words "It happened long ago, when everything was still in the jaws of the Waterserpent; it was primeval time" projects their differences clearly. The fight that ensues between them has been described as the "divine contest of primeval antiquity," and subtle distinctions exist in the qualities ascribed to water serpent and hornbill. Thus, in the Divine Order, descendants of the "superior" group of the first created people are linked with the hornbill, while the "inferior," poor, bad, ugly, and less sacred-blooded are called "Waterserpent people." Still, the concept of dualistic monism, of the two supreme deities "the Waterserpent *(tambon)* that is also the Hornbill *(bungai)*," is one of the commonest themes in Ngaju Dayak art (fig. 46).[26]

Artistic blending of the bodily characteristics of bird and serpent was also a common practice among the pre-Columbian civilized cultures of Mesoamerica and the Andean region. However, *anthropomorphic* deities with exclusively avian attributes are unidentifiable in their religious art, whereas, in Mesoamerica at least, there are several of outstanding importance who had exclusively ophidian attributes. It is more relevant that the quetzal and eagle (in Mesoamerica) and the condor (in the Andes) were important enough that they pose the problems of distinguishing zoomorphic bird/serpent hybrids of secular or decorative nature from those of religious significance and of determining which of the two—bird or serpent—was the earlier or greater numen. An important low-relief sculpture, Monument 19 from La Venta of the Middle Preclassic Olmecs (ca. 1000–600 B.C.), one of civilized Mesoamerica's earliest seminal cultures, shows

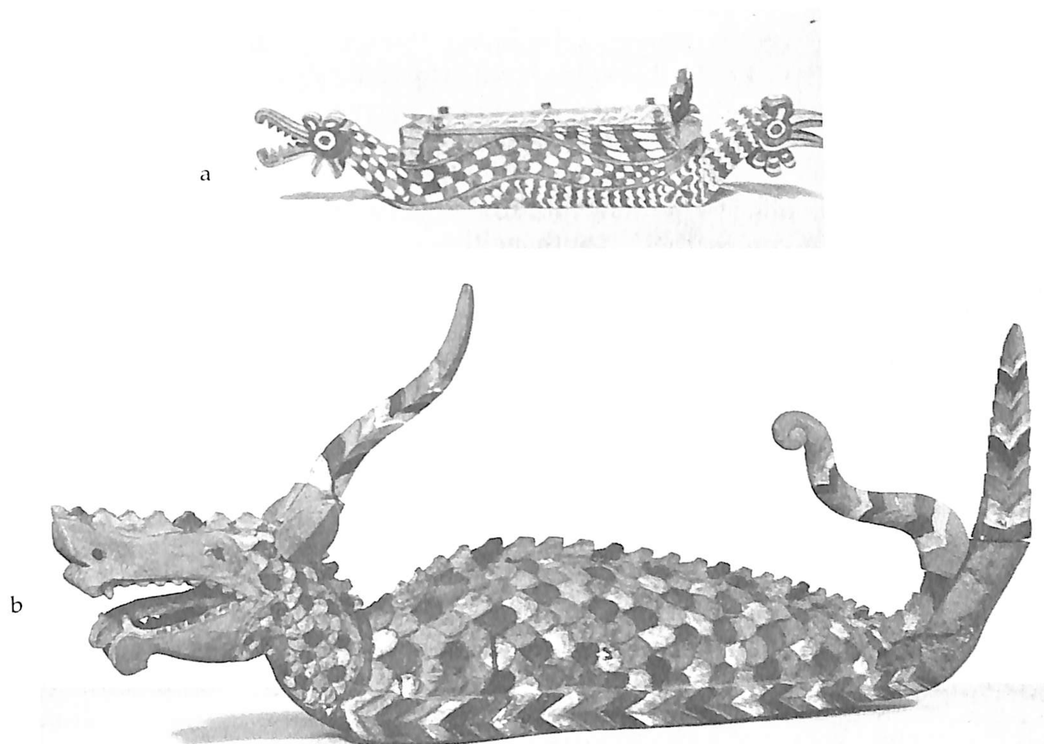


Fig. 46. Complementarity of bird and serpent deities: *a*, wooden coffin, of the contemporary Ngaju culture, East Borneo, signifying union of the water serpent (underworld god) and the hornbill (upperworld god); *b*, wooden "*nāga*" with avian, ophidian, and possibly crocodilian, traits, from contemporary Alor, Lesser Sunda Islands.

an enormous open-fanged rattlesnake poised upright as if it were an aureole for the relatively small figure, obviously an important personage such as a priest or divine ruler, seated within its curved body as if he were its alter ego. It is featherless, like others in the art of the original Olmecs,[27] whereas the green-feathered serpent (literally, *quetzalcoatl*), conceived at first probably as an artistic hybrid by the cultures of the Mexican plateau, gained ascendency as an indubitable deity only tardily—almost three-quarters of a millennium after the Olmec period.

Nigel Davies, probing some of the literature on Quetzalcoatl as a ruler-deity and on the art of the ceremonial edifices of early Teotihuacan, concludes that varied other species were plumed, that "the Plumed Serpent is apparent but not omnipresent, and by no means are all serpents plumed" and that Teotihuacan "is emphatically the city of [the primarily ophidian god] Tlaloc, not of Quetzalcoatl!"[28] The later cultures of Mexico, Toltec and Chichimec, emphasized the avian aspect of Quetzalcoatl rather more than before, but ophidian traditions continued to surface. In agricultural fertility rites, for instance, the Chichimecs poured the blood of birds and rattlesnakes into the soil, but the deities importuned, Tota and Tona, who personified the sun and the earth, were identified with the cloud-serpent Mixcoatl and "seven-serpent" Chicomecoatl, respec-

tively.[29] Later still, even the Aztecs (who raised the Quetzalcoatl cult to a high point) hardly deified the bird. Arild Hvidtfeldt's analysis of Aztec sacred nomenclature reveals at least seven deities conceived as ophidian, whose names, too, bear the element *coatl* ("serpent") as an affix; none bears *tototl* ("bird") or any more specific qualifying affix such as "eagle" to denote a bird; and there is only a solitary, nomenclaturally suggestive avian goddess, Xochiquetzal (*quetzalli*, "green feather"), with neither avian nor ophidian but floral associations, who, nevertheless, was a goddess of the underworld.[30] Through much of history, the Mesoamerican artist, like his Andean counterparts, tended to blend the characteristics of different animals into both secular and religious works, thereby blurring their relative symbolic importances as numina. Since the jaguar is also involved in these hybrid productions featuring birds and serpents, I will take up this point again in the section on felids below.

Among the Australian Aborigines, especially in Central Australia, "there seems to be little of what may be termed art for art's sake. In respect to sacred art . . . the designs are not sacred in themselves but only when applied to or in association with a place which is sacred."[31] This is apparent from D. S. Davidson's exhaustive lists of sites and index to the rock carvings, paintings, and Wondjina galleries throughout Australia. Birds, especially emus, are depicted quite often, but the frequency of serpents surpasses not only that of birds but also that of other animals of totemic significance such as the kangaroo, dingo, fish, insects, lizards, opossum, and platypus. As I have argued in chapter 1, the frequency of a motif, viewed without reference to the world view of its producers, has no meaning. These Australian artistic expressions, however, are consistent not only with the stress that the Aborigines put on ophidian themes in their mythology, but also with Elkin's observation that "spirit snakes are the commonest form of 'familiar' or assistant totem" among the sacred objects (which may include parts of animals) carried by the medicine man, the custodian of the tribe's religious conscience.[32]

The Udehe, like other Uralo-Altaic peoples, have a pronounced eagle cult, and motifs of this bird are common. One of the most important of cultic objects among them, as among various Tungusic tribes of northeastern Siberia, is a tree called *turu* or *toro* that is cut and shaped for use as a post in shamanistic ceremonies. The eagle motif may be engraved on such posts. Milovan Gavazzi illustrates an imposing example of such a post, about 6 meters high, which is forked as if to represent a serpent's bifid tongue. This analogy is clearly suggested by carvings of two serpents just below the bifurcation of the post. They are shown entwined, with a diminutive figure of an eagle carved within the space formed by their undulating forms, the heads of the serpents being shown weaving upwards, one on each half of the forked "tongue."[33]

In the legends of the Northwest Coast tribes it is not the fearsome wolf or bear, but the celestial thunderbird that is antagonistic to and feeds upon the equally mythical, abhorrent serpent *sisiutl*, a fate the latter evades by becoming a squirrel.[34] Students of symbolism, however, should note that it is not merely the serpent's earthboundedness versus the avian capacity for flight or even the specific case of predation by eagles upon the serpent that prompt notions of antagonistic polarity between these two species, as the next few cases show.

A common feature of one of the myths in at least five Indo-European literatures—Middle Persian, Sanskrit, Classical Armenian, Greek, and Latin—is the

primary element of attacks by the crane (a largely aquatic, wading bird) upon humans, usually of a smaller physical type or race of dwarfs distinct from the peoples that possess the myth. In India this hostility is expressed metaphorically through the peacock, traditionally regarded as an enemy of serpents, though actually it is outstanding neither for its serpent-eating habits nor for its flight. Peacock and serpent motifs are known on pottery as faience models and seals from the Indus Valley civilization site of Harappa, from a late phase known as "Cemetery H" overlying the remains of the earlier, true Harappan culture of the third millennium B.C. The motifs painted repeatedly on a pot (fig. 47) appear to be a comment upon the subjugation of the earlier Harappans, presumably a race of serpent-worshipping Dravidians, one of whom is depicted within the belly of a peacock symbolic of the conquering Indo-European (Sanskrit)-speaking Aryans. The fact remains that, after some four millennia of ethnic and cultural amalgamation of conquerors and conquered, neither birds in general nor the peacock have any real significance in Hindu ritual observances, whereas the serpent is exalted.[35] According to a Hindu proverb, "No one honors him who does no harm, be he ever so great. Men worship the *nāga* [cobra], but not Garuḍa, the [mythical, avian] slayer of serpents."

Except in such measure as the above shared Indo-European tradition relates to conquests of ethnically different people, the Indo-Aryans were not primarily a bird-venerating people opposed to ophiolatry. On the contrary, there is good evidence in the Ṛg Veda that the Indo-Aryans themselves venerated the serpent as did Europeans like the Balts, with whom they were allied in prehistory. In Lithuanian traditions, the serpent was revered as a house "familiar," fed, and looked upon fervently to an extent that bordered on deification. It was the "sentinel of the gods" and "loved by the Sun." The killing of serpents was forbidden, for this would "cause the Sun to cry." Such emotional sentiments were not attached to birds. Undoubtedly, they figured prominently in pre-Christian Lithuanian folklore, but they were not the epiphanies of the gods in quite the same way as serpents.[36]

Birds, particularly doves, were an important element in Cretan and Greek religion, but whether they constituted an independent or distinct cult is disputed. They are first represented in Early Minoan I, ca. 3000–2800 B.C., in a ritual conext. Pre–Palatial-period figures of birds, according to K. Branigan, are "not prolific in numbers," and few will dispute his remark that "the most popular and persistent cult in Minoan Crete was that of the Snake or Household Goddess."[37] The latter, he writes, *assimilated* the four elements that earlier had also been associated with her—the dove, sacral horns, double axe, and stone offering tables—in Middle Minoan I–II (ca. 2200–1750 B.C.), though her emergence as a "Snake Goddess" is attested in much earlier, Neolithic relics. The fact that birds, especially doves, are often represented perched on double axes or near deities has sometimes been taken to mean that they are epiphanies.[38] Divinities in Crete and Greece, it is true, are known to appear in bird form, but this is largely in story contexts—Zeus, for instance, transformed himself into a cuckoo to be caught and fondled in the hands of Hera, with whom he was in love. The most characteristic animal forms assumed by Zeus in religious contexts, however, are those of a bearded serpent and a bull, worshipped under the names of Zeus Meilikhios and Zeus Sabazios,[39] and "by far the most prominent Minoan domestic cult is that of the snake . . . an object of reverance and dread,

a



b



but also a beneficent spirit. Snake worship is also a constant phenomenon in later Greek religion."[40] Some of the clay images of ophidian and avian form produced by southeastern European Neolithic peoples of 7000 to 3500 B.C. may have been conceived as "gods and goddesses."[41] Nevertheless, tangible historical records and our knowledge of the religion of the Cretans and the Greeks—with their important cultural and ethnic roots in Neolithic southeastern Europe—suggest that, despite the continued great significance attached to the bird, the cult of the serpent, being the more assimilative, was also the more deeply entrenched. A comprehensive analysis of Greek traditions with regard to birds questions the propriety of attributing "divinity" and a "cult" to these animals: "It is the kind of problem," writes John Pollard, "in which the negative aspect of comparative evidence carries more weight than what may prove to be chance coincidences, and the results of a fairly extensive search has increased my doubts as to the existence of bird gods or bird cults in early Greek or pre-Hellenic history."[42] Pollard's doubts seem to have firm grounds, for in her classic study of Greek religion Harrison asserts that "the human-headed bird was a creature of mythology, whereas the bearded human snake was the object of a cult."[43]

Perhaps no zoolatrous culture has accorded as much attention to birds that unquestionably were deities as the Egyptian. Innumerable species, painted or carved in wood and stone with remarkable accuracy, decorate their mastabas and funerary objects. However, in roles (such as repositories of souls of the dead) shared with other animals held sacred by the Egyptians, only a very few avian species were deified. "Representations of birds that may be falcons," writes Griffiths, "derive from the Naqada I culture [ca. 3500 B.C.] but whether they have any religious import is doubtful . . . [though the falcon appears] unmistakably on a decorated pot of Naqada II." By contrast, the earliest distinct representation of Seth, the fearsome, evil antigod of Dynastic Egypt, appears, in a *nonavian* animal aspect, in Naqada I, perhaps as a god of this Eneolithic period.[44]

Now, there is no bird which the Egyptians may be said to have been "afraid" of in the same way (as our earlier examples reveal) that they were afraid of serpents, but it is not difficult to see why they eventually chose the soaring falcon, the rapacious natural predator of serpents, for special homage. It was made into an alter ego of Horus, the high god of the Osirian Triad (Horus, Osiris, and Isis), who had celestial associations and personified the sun itself. Horus's feud with his brother Seth is the central theme in Egyptian religion. The zoomorphic form of Seth is treated as problematic in the older literature, but it is known that several real or imaginary animals were associated with him, particularly the ass, known as Hiw.[45] This Hiw-ass, however, is very rare and not

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Fig. 47. Birds as antagonists of the serpent: *a*, painted motif, repeated on a large pot found at the Indus Valley site of Harappa, early second millennium B.C., probably a metaphorical depiction of the conquest of an ophiolatrous people—represented by a man swallowed by a peacock, which, in India, is the proverbial enemy of the serpent; *b*, Balinese wooden door panel, of unknown but recent date, portraying Garuḍa, the mythical vehicular bird of the Hindu solar god Viṣṇu. Paradoxically, the artist has utilized an ophidian trait—the bifid tongue—to enhance Garuḍa's ferocity.

found earlier than in the Coffin Texts. In contrast, the Hiw-serpent "figures fairly often [in spells] in the Pyramid Texts and rarely outside these," and recent scholarship tends to stress, instead of the artistic, the more pregnant and orthodox mythological evidence that Seth, the enemy of Horus and son of Geb and Nut and coming from Ombos, is simply referred to as "the serpent," the "obscene serpent," "that one," or "the god with ass's ears".[46] Thus Horus's role as the opponent of Seth is aptly assumed by the most sacred bird of the Egyptians, the falcon, when attacking Seth. Serpent that he is, Seth takes refuge in a hole in the ground.[47] Yet this epitome of malice and evil may, in other myths, also be favorably represented. He is then a benevolent god who cooperates with Horus, and the two together rise in defense of deceased pharaohs by slaying serpents that attack them. Horus and Seth provide ladders for the pharaoh's ascent into heaven, and he is on occasion even regarded as the embodiment of both these deities.[48] But acts like these do not conceal the primeval antagonisms of bird and serpent. It is *rz*, another hated serpent, and not any other dangerous animal such as scorpion or lion, that threatens the erection of the Sun Temple on the Great Primeval Mound of the *Pāy*-Land, and it is again a serpent, named *"Greatly Feared,"* the leader of fourteen others, whom the falcon Horus enlists in his fight to crush *rz*.[49]

The Egyptians embodied their main avian goddess, Nekhebet, the tutelary goddess of Upper Egypt, in a vulture—hardly a predator on serpents. On the contrary, her effigy accompanied that of the cobra deity Wadjet of Lower Egypt on royal diadems, symbolizing the unification of their respective regions. The falcon god Horus (as Heru-beḥuṭet) fought the adversaries of the sun with the help of these two goddesses—but only after changing the bloodthirsty vulture Nekhebet into a serpent.[50] Objects sacred to the ancestral spirits of the kings were kept in dual shrines known as *iterty*, dedicated to both these tutelary deities and consisting of two upright stelae that served a protective function. Originating in very early times, these paired stones, the *senut*, "the brothers" or "serpent stones," were characterized by carvings of a serpent, not of a vulture, though each was "Mistress of the Sanctuary." The custom was firmly entrenched in the canonical conception of decoration of the two so-called shrines of the empire. The Pyramid Texts considered these stelae necessary accessories of the cult of the Empire.[51] Furthermore, the emblem most commonly seen on the royal diadem when an animal is singly represented is that of the hooded cobra, not the vulture. This is particularly important because not only are sculptures and paintings of the Osirian Triad in their fully anthropomorphic forms emblematized in this way, but also numerous other deities in their fully or partly zoomorphic form bear the hooded cobra as the sole animal emblem over their foreheads—often in conjunction with the Horus (or Re-Harakty) sun. Though it was an emblem of Nekheb, the capital of Upper Egypt, there appears to be no evidence that the vulture was the object of worship there.[52] This can hardly be said of the serpent, an animal that was enshrined for worship as a protective goddess. The cult-toponymical lists of Ptolemaic temples, which reflect the traditions of much earlier periods, reveal that each settlement and temple had its own protective serpent. The literature on Egyptian religion provides far more information on two ophidian goddesses—Mertseger and Renenutet—than is available on Nekhebet.[53]

In Middle Egypt, the theologians of Hermopolis recognized a group of four

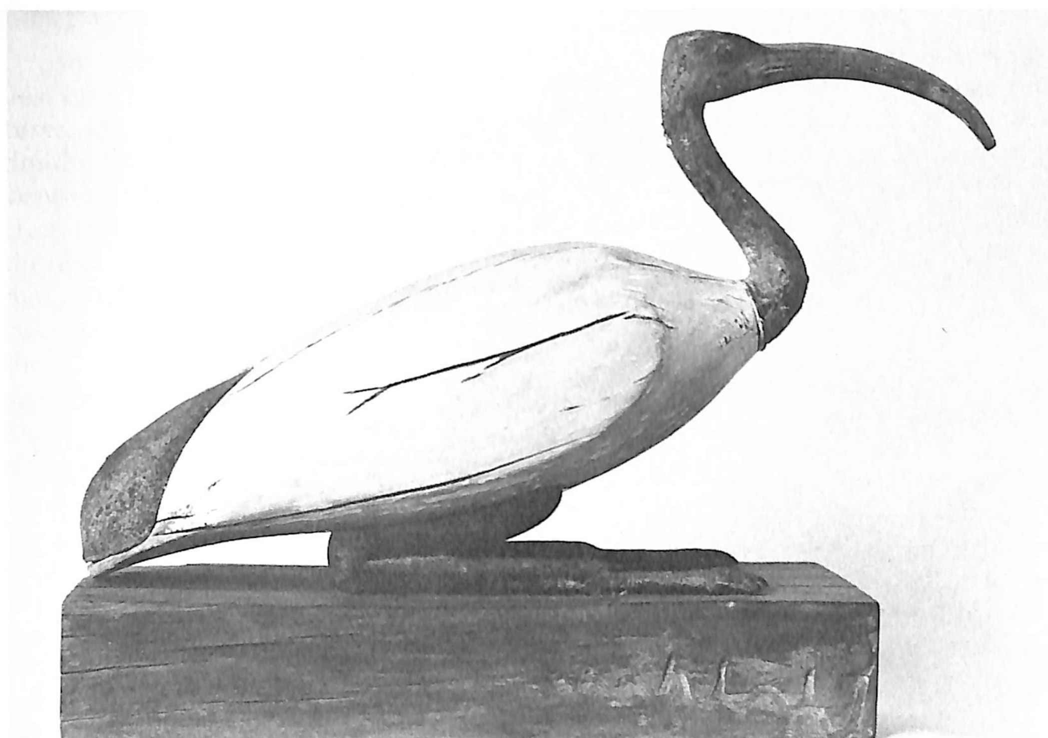


Fig. 48. Wood, stuccoed and painted effigy of the Egyptian ibis god Thoth, the patron of scribes and mortal enemy of serpents, which, reputedly, were warded off by ibis feathers; fourth century B.C., Tuna el Gebel. An almost inconspicuous, sinuous form of a serpent impaled by four feathers is engraved upon the pedestal; it is intentionally scaled down in accordance with the Egyptian iconographic canon in order to minimize the reptile's importance.

divine couples (called the Ogdoad) who personified the primordial elements that presaged the creation of the world. None of these deities was avian—the goddesses were conceived as serpents and the gods as toads, the only creatures fit to inhabit the chaotic primeval slime. In Thebes, in Upper Egypt, one of the Ogdoad, the god Amon, was symbolized by the *sment* goose (and also the ram); yet his original form was equated with that of Khamutef, the primeval serpent.[54]

The measure of ambivalence about serpents, however, is that the Egyptians expressed their enmity towards them not only through the falcon, but also through another bird, the ibis. The latter was believed to protect Egypt from invasions of winged serpents, and its feathers were regarded as death-dealing (fig. 48). Moses, who was Egyptian by birth, is said to have made an area infested by poisonous serpents passable with the help of ibises. Even crocodiles succumbed to their touch. The god Thoth, patron of scribes and learning, was incarnate in the ibis. His cult, however, cannot be compared with that of the serpent. It is late in origin, its popularity increasing only during the second half of the period of the New Kingdom (ca. 1200 B.C.), when the ibis actually became a cult symbol.[55] All these examples suggest that the serpent was extraordinarily numinous in Egypt and that its reputation was enhanced, but never overshadowed, by the bird.



Fig. 49. Painted pottery idol of a personage (deity, shaman?) with a serpent atop his head, Yang-shao culture, Neolithic, 3000 B.C. or earlier, Pan-shan, China.

In Neolithic China, the black- or purple-painted pottery vessels of the earliest farming communities (the riverine Chung Yuan and Kansu Yang-shao cultures, ca. 4500 B.C.) include a few small, undistinguished bird motifs wholly dominated by those of fish. In general, zoomorphic designs are infrequent and very limited in variety, swirling, geometric patterns predominating. There are cross-hatched and parallel-linear painted patterns, but there is no proof that these are ophidian symbols. In view of the relative scarcity of bird and animal motifs, therefore, two outstanding Yang-shao mortuary relics that hint at the cultic significance of the serpent in early China are noteworthy. One of these is the pot with an ouroboros motif already described (fig. 39*a*). The other (fig. 49) is an earthenware image, presumably a deity's, with a serpent in appliqué over its head—the markings and numbers of sections painted on the serrated base clearly suggesting lunar and ophidian connections.[56]

Bird motifs are increasingly frequent in China after the Neolithic period. What was their significance relative to the serpent's? A valuable series of leads on animal veneration comes from Shang-period records of divination in the form of oracular inscriptions on the shoulderblades of oxen and carapaces of tortoises, traceable to a northern people whose political identity is apparent by 1766 B.C. Tsung-tung Chang's compilation of these inscriptions includes a solitary reference to a sacrificial offering simultaneously to a bird and to clouds personified by an individual addressed as Ti, but, in practice, the Chinese from time immemorial have associated clouds not with birds, but with dragons, which are only mythic serpents. The oracular references to their ritual, divine associations emerge much more strongly than the bird's. The oracles also allude to a "dragon-land," perhaps the land of the shamanistic Huns of Central Asia, who annually observed rites of a dragon cult.[57] The *Chia Pien* list of oracle-bone inscriptions contains no less than forty-one variants for *lung*, "dragon," a creature venerated for its boons of fertility and prosperity as much as for its awesome royal associations. It was comparable to "kingly majesty, sitting aloft on his dragon throne and inspiring such terror that [like the Egyptian Pharaoh with this uraeus diadem] he can only be approached with abject mien and downcast eyes, but [who was] at the same time the 'father and mother' of his people." The temples consecrated for the worship of Lung Wang, the "Dragon-King deity," were particularly numerous in North China and were centers of rain making rituals.[58] Thus the dragon was regarded as the archetypal serpent. It seems to have been the custom to cudgel to death, dissect, and offer serpents at the altar of the mountain god, Yüeh. They were sacrificed, as a certain means of putting an end to incessant rains, in ceremonies that may have been part of an astral cult as well. Yet the river god Chih and a god known as "double serpent" are asked in the oracles whether a ritual immolation (of pigs and sheep) will move them into sending rain and whether the people should celebrate a rain dance to honor "double serpent."[59] Chêng Te-kun indicates that "the oracle script repeatedly uses the character for snakes and other crawling animals, such as insects and silkworms,"[60] but there is no evidence that the latter two were venerated any more than birds. The Shang-period pictogram "bird" is quite realistic[61] compared with "dragon," but the latter is of interest because ritual vessels representing it both imitate the subtle form of the pictogram and betray the ophidian archetype (fig. 50*a*, *b*, *c*).[62]

Bird and serpent, or dragon, motifs each maintain popularity in the highly

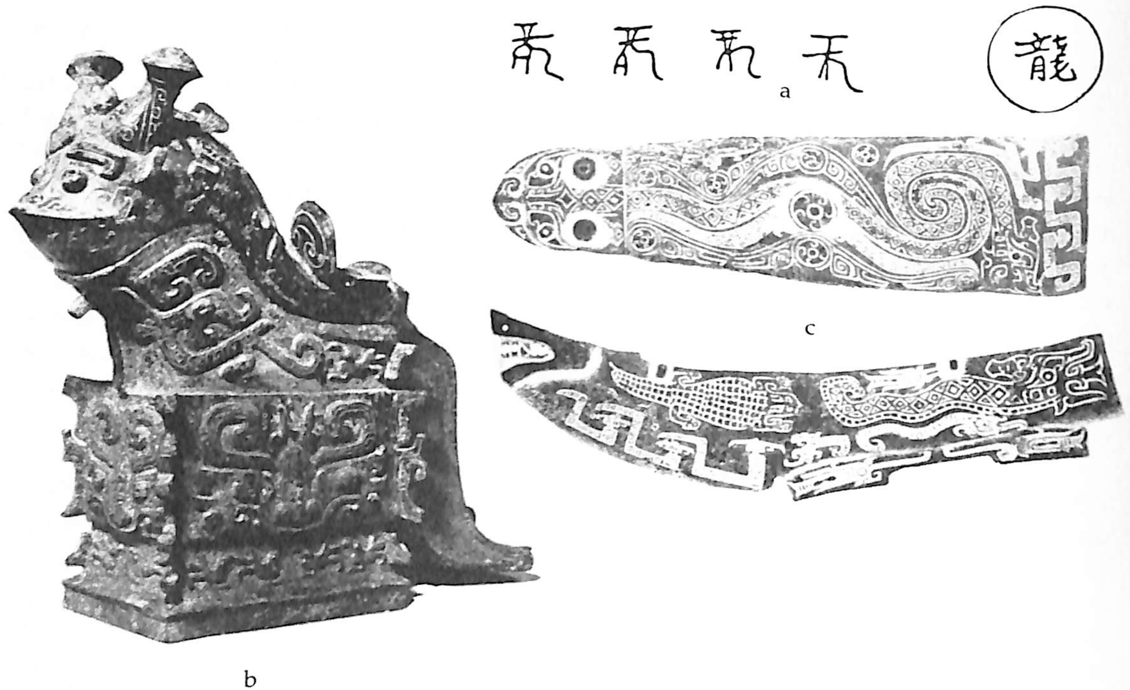


Fig. 50. Dragon motifs in Shang and Western Chou periods of China, mid-second to early first millennium B.C.: *a*, variants of the pictogram "dragon" on Honan oracle bones compared with the modern form of the sign (encircled); *b*, bronze, ritual wine vessel of the Western Chou, of the type *kouang*, which mimics the pictogram closely; *c*, ophidian motifs engraved upon a Shang-period wine vessel (top and profile) of the type *kouang*, including naturalistic as well as highly stylized bifid tongues.

stylized art of Shang and Chou periods up to about 256 B.C. The interrelationships of these two North Chinese societies are beyond our scope, but archeaeology and art history reveal that they shared technological and religious traditions whose roots lie in the Neolithic cultures of the region—indeed, that the Western Chou "took over the Shang culture in bronze metallurgy, burial rites, and decorative art in virtually unaltered forms."[63] The recognition of the bird symbol presents no problems, nor in most cases does that of the serpent. In the Shang and early Western Chou bronzes the single most characteristic decorative motif is a highly stylized face, *t'ao-t'ieh*, within whose constituent elements various animal forms may be recognized, including ophidian ones with bifid terminations. The *t'ao-t'ieh* gives way in the latter half of the Western Chou period and the early half of the Eastern Chou period to *ch'ieh ch'ü* and *p'an ch'ih*, patterns of interlocking serpents in pairs or groups, respectively. In view of the frequency of conjoint avian and ophidian motifs in Shang and Chou stylized art, it is important to recognize (see fig. 51 *a–e*) that the bifurcate processes that form part of the design are cryptic but nonetheless ophidian symbols.[64] Serpent motifs are quite distinct in the bronze owls of Shang and Chou funerary art. Owls were then an honored species, but they later fell into disfavor because of their alleged habit of killing their young, which made them inauspicious as symbols of filial harmony. Unlike the eagle or hawk, which are not prominent in this art, the nocturnal owl



Fig. 51. Decorative symbols in Shang and Chou art: *a, b,* and *c,* naturalistic and stylized serpent motifs of the type *p'an-ch'ih* (many interlocking serpents); *d,* serpent motif of type *ch'ieh-ch'ü* (paired interlocking serpents); *e,* avian motifs commonly engraved upon Western Chou bronze objects, with elongated bifid processes emerging from the frontal sides of the birds; *f,* stone sculpture of an owl from the Shang royal tombs at An-yang, and *g,* Chou bronze owl (wine vessel *niao-tsun*), both characterized by ophidian motifs on the edges of the wings and associated (possibly lunar) symbols either within the body of the serpent or on the bird's neck.

has no solar associations, but, like them, it does feed on reptiles. And though the serpent does figure in Chinese lunar myths,[65] the owl was not made a symbol of antagonism in the manner of the Egyptian Horus-falcon. These highly stylized bronze owls are of interest because they carry serpent motifs on the edges of their wings along with cosmological emblems of the type seen in figure 39*b*. Corresponding to the number of days of the bright-half period of the lunar month, the "lunar emblem" occurs fourteen times within the coiled body instantly recognizable as a serpent's by its ventral scales (fig 51*f*). The owl in figure 51*g* has the head of a ram (not outstanding as a cult animal) on its breast, but the more significant element, though it is devoid of lunar emblems in this case, is the serpent, seen in pairs at the edge of each wing.

The relative status of avian and ophidian symbols during later times (when the owl was no longer popular) may be gauged from a signally important funerary banner from a Han-period tomb (ca. 174–145 B.C.). The composition on this silk banner, which includes a raven and five cranes, is dominated by twisting dragons and serpents. Its central character has been termed a "human-headed deity." He is a robed personage with a long, coiling serpent's tail, to whom the five cranes seem to be paying homage.[66]

The occurrence of the bird motif on Chinese funerary objects since very early times cannot be denied, but, as E. Lyons points out, it is curious that there are so few references to them in the texts. In contrast to this, the *k'uei* dragon that inhabits the clouds and sends rain is not a mere decorative motif that stands out conspicuously in the repertory of fantastic, composite animals engraved on ritual object included among mortuary goods. Especially during the Late Chou period, ring discs of jade, of the kind called *pi*, one of the rarer but more prestigious symbols of heaven, were placed in the mouths of, or under, the corpses of important persons. They often have repeating engraved patterns of small coiled or open serpentine forms—the special ritual importance of jade residing in a belief about its supernatural origin and ability to prevent the decay of corpses.[67] This mundane use, however, is not so evident as other symbolic values placed upon the patterns until the end of the Chou period, up to about 500 B.C. In some "utterly splendid examples," the animal depicted on the outside rim of these *pi* discs is not the bird, but, says Lyons, the dragon.[68] Thus, the *numinous* qualities of the dragon are only a reflection of those attributed to the archetypal serpent. The veneration and legendary power of this creature, however, have continued in popularity up to modern times, and with an intensity that the bird has not matched at any period in Chinese history. According to Arthur Waley, "The god of the Yellow River is the only one who continued to be prominent in Chinese legend and whose cult went on till modern times. . . . Among the deities who figure in the *Chiu Ko*, or Nine Songs, of Ch'u shamanism the River God is the only one about whom much is known. The others quickly fade out of Chinese cult and legend."[69] In these hymns dragons figure prominently as the attributes of this god, Ho-po, as the animals that draw his chariot, and they are also seen in the regalia of the shamans of Ch'u religion.[70] By contrast, birds, such as the phoenix, have an auspicious, decorative value but no clear religious role. The measure of this obscurity is that an encyclopedic work like E. T. C. Werner's *Dictionary of Chinese Mythology* itemizes neither phoenix, owl, eagle, cormorant, sparrow, pigeon, etc., nor even "Birds" and that Wolfram Eberhard's index to the local cultures of South and East China (while

replete with references to specific serpent and dragon deities and cults) lists no specific bird deities and, indeed, is meagre on birds.[71]

Florance Waterbury uses the word "deity" in reference to birds in Chinese art. Perhaps inadvertently, if in the end correctly, she denies them divine status by admitting that "none of the bird-deities were worshipped [though] . . . .they were cherished for over fifteen hundred years."[72] In contrast, over a far longer period of Chinese civilization the archetypal serpent, as the attribute of local gods and as dragon, has commanded veneration to a degree that fully earns for it the status of cult animal.

CHIROPTERA

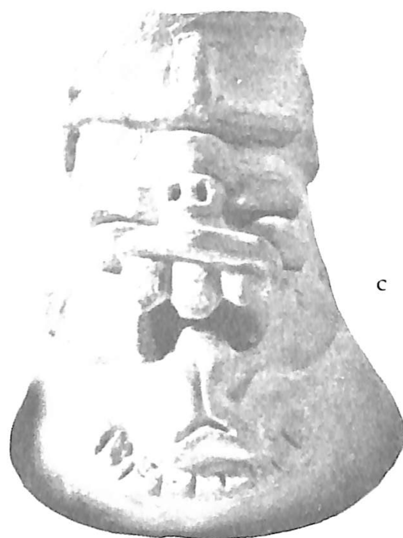
The bat merits at least brief mention because it is the only mammal that is capable of birdlike flight, its large gregarious populations cannot go unnoticed in its geographically extensive range, and it will be theoretically significant in my concluding chapter on man's symbol-making propensities. As far as I have been able to ascertain, however, there is in the Old World not a single civilized society and perhaps very few (if any) primitive ones in which the bat is accorded the status of leading cult animal or symbol of a major anthropomorphic deity. It is conspicuously absent or obscure in the religious myths of Hindus, Buddhists, ancient Egyptians, Mesopotamians, and Greeks. John S. Mbiti's comprehensive survey of African cult animals includes no information on bat deities, but Hastings's *Encyclopaedia of Religion and Ethics* mentions a few secular myths about the animal from around the Old World.[73]

For reasons better understandable later, the most noteworthy cases of bat veneration occur primarily in Mesoamerica and a few other parts of the tropical and subtropical New World. The bat god is perhaps one of the early if not earliest members of the Zapotec and Maya pantheons (fig. 52*a, b*). He is represented by an effigy in jadeite found in Zapotec mortuary urns from Oaxaca, Mexico (Monte Albán II, ca. 300–150 B.C.) and by images in clay known as the "god of Glyph L" and portrayed as a seated man with a bat's face for a mask. His effigies, however, are far fewer than those of Cocijo, the ophidian rain god of central importance in the Zapotec pantheon, stereotyped as a personage wearing a grotesque mask with fangs and a prominent bifid tongue (fig. 52*b, c*). Pottery images of Cocijo are known in the style of the earliest period (the Formative or Preclassic Monte Albán I, ca. 800–300 B.C.), though the style destined to become that of Monte Albán I may have been developing during the years 1500–1000 B.C. In addition, the remarkable feature of bat-god images is that many of them carry (as do bird and other animal images at Monte Albán) a stylized motif—based on a Zapotec hieroglyph—which is thought to be an ophidian symbol modeled upon the "eyebrow" (or supraocular) scale (fig. 23*a, b*) of a Mexican variety of rattlesnake.[74] Details of this motif must be postponed until the section on felids, but it occurs frequently either in the central part of the bat god's headdress or body ornamentation or as his eyebrows or upper lip. To the extent that images of other species of animals also bear this ophidian "eyebrow" scale emblem, the bat god may, like them, be regarded as rather subordinate to Cocijo, the god of rain and agricultural fertility.

The Tzotzil Maya of Chiapas, Mexico, take their name from *zotz*, "bat," but retain vestiges of serpent veneration despite the inroads of Catholicism. Next to



a



c



b



d

ancestral gods, vague "fathers and mothers," their most important deity, the "Earth Lord" Yahwal Balamil, is anthropomorphic but lives underground, owns all the waterholes, controls the clouds and lightning, and has the attributes of serpent and thunderbolt.[75] The Cakchiquel Maya of Guatemala had a bat god, perhaps their chief deity, who, too, dwelt underground, in Zotzila. His name, Chaomalkan (or Chamalkan)—which means "beautiful (or glorious) serpent"—suggests agrarian associations, for *kan* in proto-Mayan means not only "serpent" but also, secondarily, "maize kernel." The regional variant *chan* also means "serpent." To several Maya groups, the Chorti in particular, the *chicchans* were four gigantic celestial serpents that dwelt at the bottom of large bodies of water at the cardinal points in space and whose violent shouting at one another was manifest as thunder, lightning, and rain. It is of interest that Maya hieroglyphs include a bat-head sign with an affix known as the *kan* cross, which is a symbol of water (represented by beads or droplets) synonymous and interchangeable with the sign *yax,* which personifies the rain god Chicchan or Chaac (literally "rain") of the Yucatec Maya (fig. 53).[76]

Thus ophidian traditions were inveterate amidst the chiropteran ones. This is not to minimize the bat's importance among the Zapotecs, Maya, and Huastecs.[77] However, this animal's ancillary status in cult is evident from the sporadicity of its veneration. The extensive pantheon of the Mexica lacked a bat diety, but their myths included *mazacoatl,* the equivalent of the *chicchans.* Throughout Mesoamerica, it is the serpent that is ubiquitous in religious monuments and the day-name symbolism of religious calendars, not the bat.[78]

That the latter's occurrence in works of art seems practically inseparable from contexts that also include ophidian traditions is true even beyond Mesoamerica. Pál Kelemen describes a few objects featuring bat motifs (or "gods") from Central and South America, including a repoussé gold pectoral from Ecuador. Its center has the head of "the [bat] deity . . . almost subordinated to the elaborate independent decoration that surrounds it."[79] This decoration includes four crude double-headed animal figures from whose mouths hang distinctly bifid tongues.

FELIDAE

Tigers, leopards, jaguars, and lions are surely most important as animals that impress man by their "ferocity." It is as difficult to generalize about their

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Fig. 52. Zapotec deities, images in clay: *a,* bat god with headdress in the form of an open-mouthed serpent's upper jaw or lip and ear ornaments in the form of corn cobs, which in Mesoamerica generally possess—linguistically, in hieroglyphs, symbolic art, or agriculture—distinct ophidian associations; *b,* detail of the face of a bat deity with a deeply furrowed and lobed, though not bifid, tongue; *c* and *d,* representations of Cocijo, god of rain and agriculture, in an iconic style ascribed to an early phase (Phase I, mid-first millennium B.C.) of Monte Albán, Oaxaca, Mexico, with clearly bifid tongues and the bracket-like upper lips common to both bat and serpent images. In Mesoamerican iconography, the ophidian tongue is a recurrent, variously stylized decorative emblem. The form typified in *d,* for example, appears inverted over the head of the bat image *b* and, in figure 71*b,* on the forehead and jaw of the humanoid face adorning the headdress of the goddess Cihuacoatl.

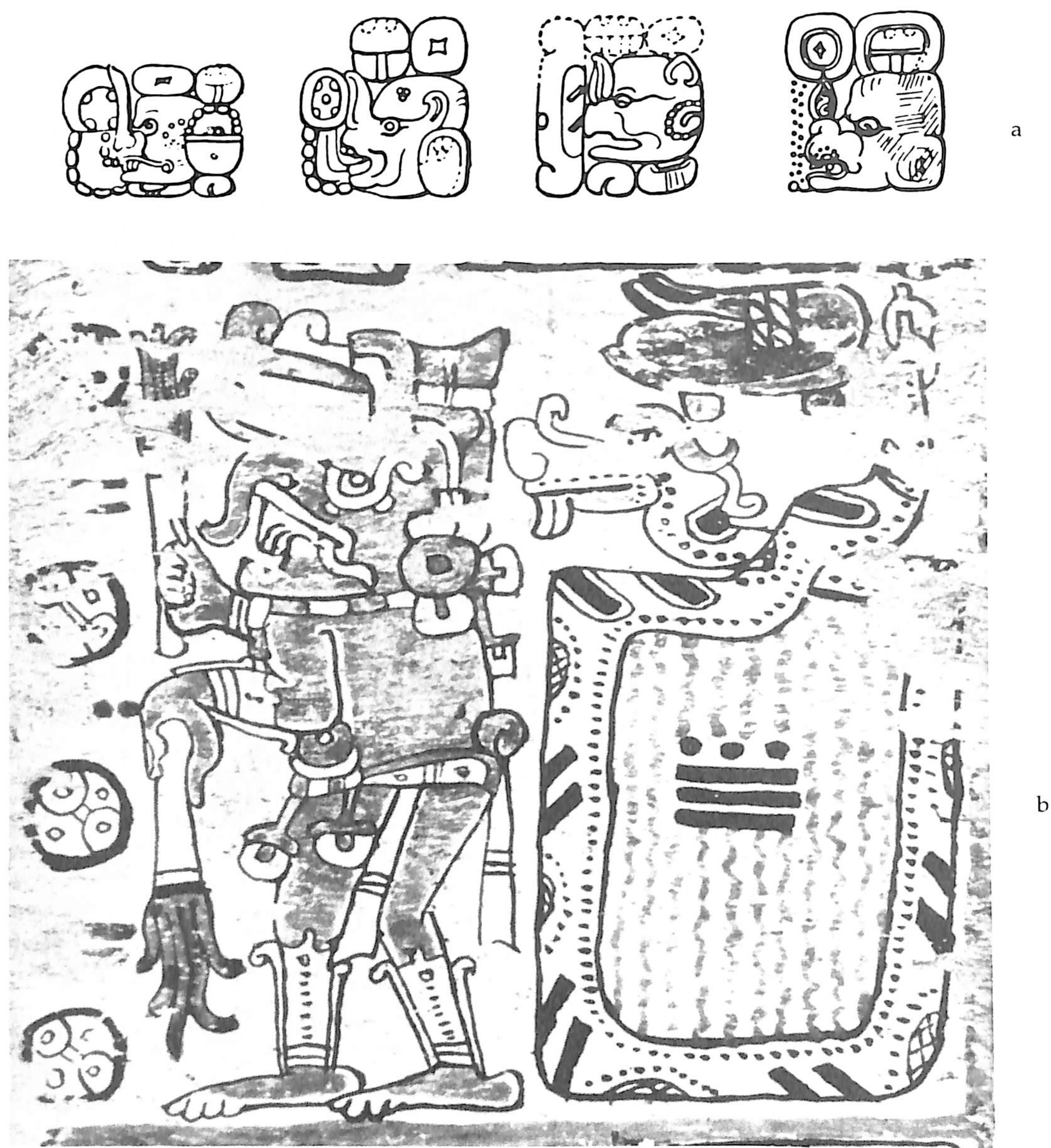


Fig. 53. Mesoamerican symbols of water: *a,* variations of the Maya hieroglyph *zotz,* "bat," with affixes signifying water or rain—synonymous with the Maya deity Chicchan (or Chaac); *b,* Chicchan, sometimes conceived as a long-nosed anthropomorph, as portrayed in the Codex Tro-Cortesiano, alongside his alter ego, a gigantic serpent coiled around a pool of water.

symbol-engendering qualities as it is to speculate on the extent of their interference with, or actual danger to, man during his biological and social evolution. As the last links in the biological food chain, felids, like other slow-breeding carnivores, perhaps never attained numbers large enough to be considered pestilential. Normally retiring in their habits and rather selective in their choice of prey (usually cervids and caprids), they probably affected man little through their presence in or near habitats he preferred. They at times attack man and

subhuman primates—leopards, for example, occasionally prey on baboons and chimpanzees. Until the late nineteenth century, tigers were numerous in haunts that ranged from the Amur River basin in northeastern Siberia to the Trans-Caucasus and from Iran to Indonesia. The prolonged roars and caterwauls of males assembled in competition for a tigress in heat can be spine-chilling to neighboring people concerned about their own safety and that of their livestock. The awesomeness of felids, however, is of quite a different kind than the serpent's, as most zoo-goers will admit: The appearance and movement of the large cats elicit admiration, but those of the serpent generally repel us. This difference in attitude may in part explain their relative positions in cult.

The aboriginal Baiga of central India, who have a profusion of animal myths, particularly about tigers and serpents, embody their deities in a variety of animals. Chitawar, a dangerous divinity, when incited by a witch or annoyed, becomes no tiger, but "assumes the form of a snake and bites his enemy."[80] The tiger and the serpent also figure very frequently in the myths of the Naga tribes of northeastern India. The Sema Naga are said to venerate serpents, but about tiger veneration there is no information. It is not clear whether the Angami and Rengma Nagas venerate or deify either of these animals, but field studies mention innumerable superstitions about the serpent's ferocity, roles in taboos, medicinal values, and involvement in love charms and human fertility.[81] The Gond, an aboriginal forest people of Dravidian affinities widespread in central and eastern India, inhabit regions whose dangers are reflected in a prayer to their sun god: "O Narayan Dev, eat this [sacrificial] rice and meat. Save us from tigers, serpents, and bears that may invade our homes. Protect us from disease." They have a serpent deity Nag Dev, to whom decapitated cobras are sacrificed, but they worship no tiger deity.[82]

Aboriginal elements involving animal, tree, and stone worship pervade Hinduism, an amalgam derived largely from the social attitudes and religions of civilized Dravidian and Aryan peoples, yet Hindu mythology and its highly categorized iconography are replete with serpent lore and serpent deities and conspicuously short on feline deities and symbolism. The tiger, or lion, is merely the mount of the goddess Durga (conceived not earlier than the Christian era), who is a mythical aspect of the universal goddess Devi. The lion as represented by the lion-headed anthropomorph Narasimha-avatar, a transient aspect of the major god Viṣṇu, signifies brute, not numinous, leonine power—but Viṣṇu's permanent alter ego, his corporeal essence, is represented by Ananta (or Śeṣa), the cosmic serpent. The lion in ancient India was conventionally a throne motif, but no more so than the serpent.[83]

Elsewhere, felids are far more important, and certainly more obvious as symbols of the cultures of northeastern Asia, the edge of the tiger's range; of the Near East and Africa, the homes par excellence of the lion; and of Meso- and South America, represented by the jaguar; but nowhere do felids overshadow the serpent as a cult animal.

In Siberia, the Nanai of the Amur and Ussuri River basins employ amulets to heal or ward off disease.[84] One type (fig. 54*a*) is metallic and depicts pairs of serpents facing each other. Normally, four pairs are crudely cut into each amulet. Ancillary figures of the tiger or bear (around which, also, a cult exists) may or may not be cut into the amulet or hang from it. Another type (fig. 54*b*) is anthropomorphic and cut from wood. Its body is flat and its head oval. This is a

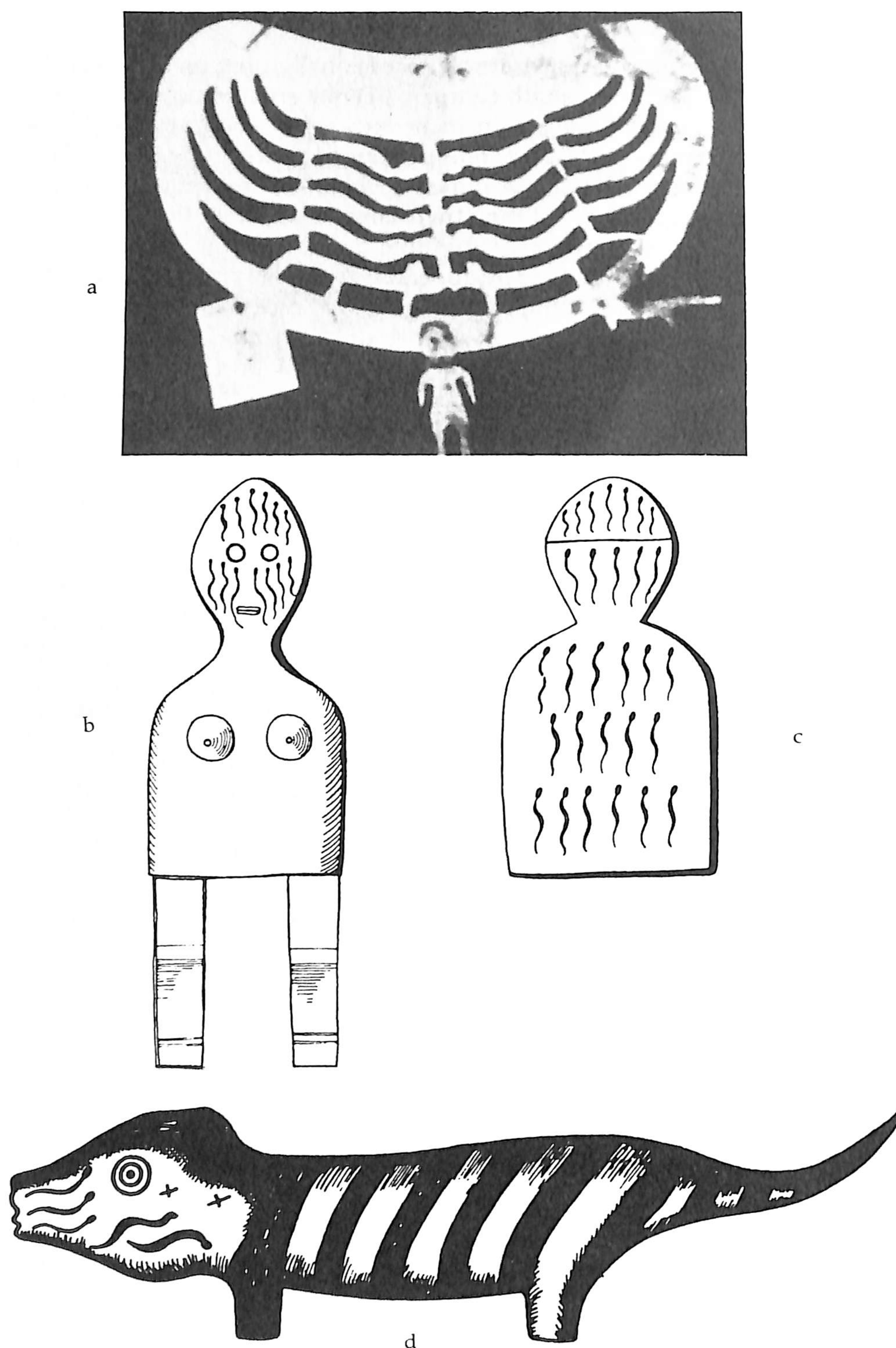


Fig. 54. Amulets of the Nanai culture, eastern Siberia: *a*, metallic (*moigani*-type) representing four opposed pairs of serpents above an opposed pair of tigers; *b* and *c*, anthropomorphic (*aiami cani*-type) "tiger" amulets with stripes in the form of serpents; *d*, zoomorphic (*seuen*-type) tiger amulet with serpents painted on the face.

"tiger" amulet, the stripes being serpents etched and painted on the head and body. Similar anthropomorphic "panther" and "bear" amulets are also made. In each case, the oval heads are etched, on one or both sides, with a horizontal straight line. This cannot fail to recall the motif of the Upper Palaeolithic sun deity from the Yenisei gravestone described earlier (fig. 40*c*). Whether these Nanai amulets are in fact derived from cults of an age as dim and distant as that reflected in the strong ophidian symbolism of the Yenisei gravestone is difficult for me to ascertain. If so, the cultic emphasis placed on these animals relative to each other may be worth further archaeological study, for I am not aware of comparably ancient stone monuments that have tiger motifs. A. P. Okladnikov mentions that serpents, deer, and waterfowl are the most prominent among the motifs on petroglyphs of the Amur and Ussuri Valleys datable to the second to first millennium B.C. These are chiefly local creations, unrelated to the Central Siberian. He does not specifically mention feline motifs. Tiger cults still prevail among the Nanai of these river valleys, and Okladnikov stresses the relationship of their art forms to the ancient petroglyphs.[85]

Shamanistic elements akin to those of ancient northeastern and central Asian tribes seem to have diffused into China, specifically via the religion of the Ch'u, in the regalia and ritual objects of whose shamans the varied animal motifs of Siberia recur. Though the totem name of the ruling class was *hsiung*, "bear," and antler, bird, and tiger motifs are known, sometimes as hybridized ones, the inordinate emphasis on serpent motifs in Ch'u beliefs is clear from Minao Hayashi's analysis of deities painted on a silk manuscript, one of the most valuable finds in Chinese archaeology.[86]

In Chinese art throughout history, two recurrent motifs representing semimythical animals seem especially important—the dragon and the *t'ao-t'ieh* or "ogre mask." Now, the Chinese have long regarded the tiger as a guardian of graves, a repeller of evil spirits. One may easily envision a tiger's wide-open jaws and fearsomeness in *t'ao-t'ieh* and regard feline features as predominant in these stylized emblems, whose magicoreligious function is suggested by their frequency in bronze vessels and other mortuary effects. Some, who insist that feline identity is unproven, hold that a buffalo's or some fantastic animal's head or a human face distorted into the half-devil, half-animal form the Chinese often prefer for creatures of the underworld is equally plausible. The identity of the animal represented by the *t'ao-t'ieh* mask may be elusive, but that of the body often found attached to it is far less so in the narrow Shang-period bones with carved decor which portray a *t'ao-t'ieh* head attached to an "unmistakable serpent body with clawed forelegs" (fig. 55*b*), a creature also represented by bronze ritual vessels known as *k'uei* and *kuang*. The consensus seems to be that the *t'ao-t'ieh* is "a design complex consisting of horned mask over split-animal body, being a horned serpent, similar in form to the written symbol associated with *lung*."[87] The latter, as I have noted, signifies "dragon." Thus, it is remarkable that whereas Chang's compilation of Shang oracle-bone inscriptions includes only one reference to a felid—the leopard—in uncertain contexts of a cult sacrifice, allusions to the serpent as a votive object in rain dance ceremonies are frequent and complement the fact, already noted, that no less than forty-one characters considered to be forms of *lung* appear in the *Chia Pien* list of oracle-bone inscriptions.[88]

An extraordinary group of funerary relics from a Ying-Shang cemetery, ca.

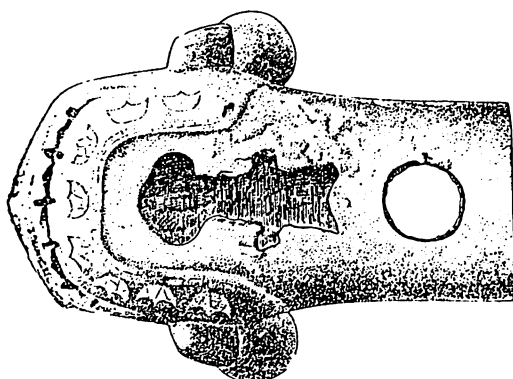


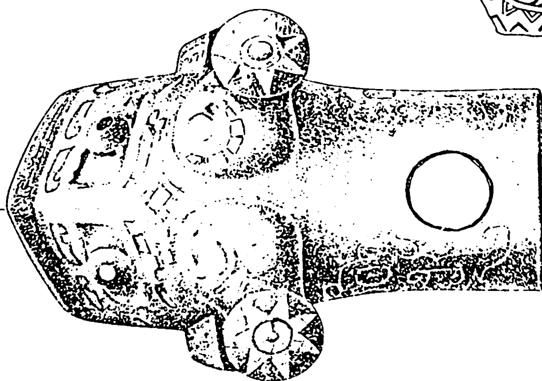


a



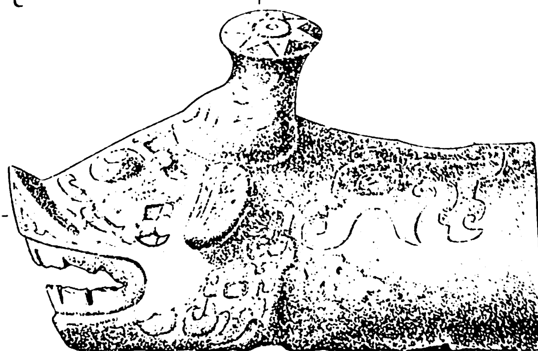
b





c





1400–1100 B.C., hint at the status of the tiger vis-à-vis the dragon in China (fig. 56). These objects make up a "procession" of three animals, each represented by a pair of identically carved jade, in two parallel rows, with the dragon (possessing only forefeet, as in the Yang-shao example in fig 39*a*) leading the buffalo in each row, the tiger trailing last. The tiger is the smallest of the three animals, the dragon the largest.[89] Furthermore, the design on the ground of the cemetery (not illustrated) appears to suggest the form of a stylized serpent with bifid tongue. The hierarchical order of the animals in this cemetery group and its relevance to questions of a probable cultural continuum (whose beginnings in precivilized societies of the region are indistinct) is that the site, Hou-chia-chuang, in An-yang, has elsewhere yielded a certain style of painted pottery that can be related to the Chung Yüan phase (ca. 3650 B.C.) of the Neolithic Yang-shao culture, some of whose pottery motifs I have already mentioned.[90] In archaeological contexts such as these, my impression is that while both the tiger and the serpent figure importantly in Chinese ethnohistory, the status of the serpent as a cult animal, both per se and as mythic dragon, is by far the less misty one throughout, though traces of a mountain deity in his tiger aspect are known to have survived feebly among some local cultures of South China and neighboring regions.[91]

The Balonda of east-central Africa may be one of the very few primitive peoples to worship an icon said to be that of a lion. The explorer Livingstone noted that it was made of grass and clay and resembled a crocodile more than anything else.[92] Mbiti's survey of animal cults in Africa mentions no society whose principal divinity is embodied in a lion or leopard, though these animals may be of totemic import.[93] The Gä of Ghana worship Ghobu, "doubtless once a leopard-god, but his leopard nature is almost forgotten," according to M. J. Field. In contrast, he mentions repeatedly and at length at least four major distinctly ophidian gods—Owufu, Aya, Osabu, and "the Almighty" Awudu. Moreover, though witches and demons may ride leopards, "most commonly of all [they ride] snakes."[94]

In Ethiopia, only "certain Galla" tribesmen regard the lion as sacred, whereas the serpent cult is widespread.[95] In his analysis of various tribes of the Sudanese Dinka, Godfrey Lienhardt found that clan divinities were regarded as immanent in a wide variety of animals, the black cobra and the lion being among the most notable. Surprisingly, the leopard, actually a more dangerous animal than the lion, is not a clan divinity.[96]

The numinous role of the African lion is most concretely manifest in the mythology and religious art of ancient Egypt and its cultural heir, the kingdom of Kush in Nubia. Inhabiting the extensive desert tracts bordering Egypt's populated centers, "where the sun each day is reborn and extinguished," it is

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Fig. 55. Highly stylized, preponderantly ophidian (*cum* other animal?) motifs in Shang Chinese mortuary objects: *a*, *t'ao-t'ieh* masks, the most characteristic single motif of Shang and early Western Chou bronzes; *b*, two bone spatulas with representations of ophidian body and bifid tongue, actually stylized versions of the "one-legged" or *k'uei* dragon (so-called because in profile, or in frontal view, only a single pair of legs is depicted); *c*, a bronze head of the horned dragon, from a Yin-Shang cemetery, 1400–1100 B.C., An-yang, Honan, China. Observe *a* and *b* carefully for details.

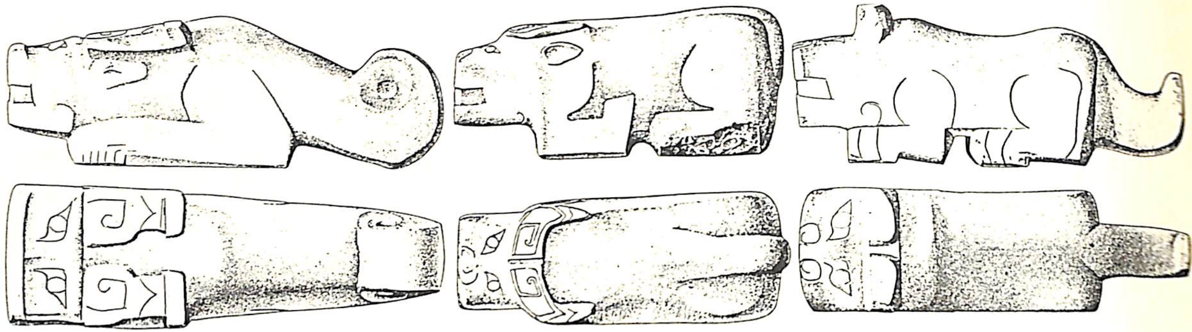


Fig. 56. *K'uei* dragon, water buffalo, and tiger. Jade sculptures from a Yin-Shang cemetery, 1400–1100 B.C., An-yang, Honan, China. Two almost identical sets were found positioned parallel to each other, but, for illustration, profiles and top views are shown of a single set. Dragons lead the "processions," and the tigers are placed last.

but one of the several animals that were involved in the Egyptian myth of the Nocturnal Journey of the Sun. A pair of lions guarded the two horizons, symbolizing the day past and the day to come, and were considered rejuvenators both of the Earth and the Sun and of people asleep, i.e., of bodies "temporarily extinct." A Heliopolitan creation myth recounts that the first two issues of the solar demiurge were a pair of lions. For all its high status in myth, reputation as a terrifyingly aggressive animal, solar symbolism, role as protector, and metaphoric associations with a divine royalty, the lion was represented in the Egyptian pantheon by but one major deity, the goddess Sekhmet (in Memphis; also known by various synonyms, such as Pekhet in Beni Hassan and Bastet, the *benign* cat, in Bubastis). Three others (Menhit, Tefnut, and Nefertum) have human-leonine aspects but seem less important in the cult. On the other hand, the list of nonsynonymous ophidian divinities is long (see n. 17). Nevertheless, the fact that lion or lioness cult centers occurred especially frequently at the mouths of the desert wadis, i.e., in those places where prehistoric hunters and caravans entered the habitat of the wild animal and sought its mercy, attests to a fear of its predatory potential. Inscriptions refer to the lioness as "the great one who wanders through the wadis, who dwells in the middle of the eastern desert," "she of the sharp eyes and pointed claws who catches sight of and snares her food by night," "the desert mistress" who "sends the annual pest" (probably the locust), and "the dangerous animal with the wild look."[97]

To the Egyptians, however, fearsomeness was no more inherent in the leonine goddess Sekhmet than in an animal of problematic identity that represented Seth or in their scorpioid, crocodilian, and ophidian deities. Several of Sekhmet's symbolic features were also shared by other animals sacred to the Egyptians; the scarab beetle, representing the god Khepri, for instance, denoted the rising sun. Egyptian religion and art tend to assimilate the functions and characteristics of different deities inter se, and consequently, to hybridize their varied zoomorphic alter egos, sometimes making their identification difficult in the absence of inscriptional information. Yet the animal species that was most often chosen for embodying a particular divinity is not difficult to ascertain. The unique fusion of leonine and ophidian forms, then, is merely an affirmation of

the power of each species and the divinity it represents and is reflected in the fact that of the five principal hybrid iconic forms taken by the very important, typically ophidian goddess Mertseger, four involve the fusion of human with serpent body or head or vice versa. There is one subvariant among these in which a vulture's head (the goddess Nekhebet's) is added. Except for this, the fifth, and only, exclusively zoomorphic hybrid form is the lion-bodied Sphinx—not human-headed, but with the head of Mertseger, represented as uraeus, the cobra with spread hood.[98]

Images of Sekhmet abound. She is commonly conceived as an anthropomorph with the head of a lioness atop which she usually carries a solar disc bearing the uraeus cobra as a diadem (fig. 57). Sekhmet is a destroyer of the enemies of the sun. Several other zoomorphic Egyptian deities, too, notably the falcon that represents the sun god Re as much as it does the "sun-eyed"sky god Horus, bear the solar disc with its emblematic cobra. What is notable, therefore, is that Sekhmet's own solar symbolism associates her conceptually and iconographically not with the falcon or with the scarab beetle, cow, crocodile, and ram (which also have solar attributes), but with the serpent. Both Sekhmet and the cow goddess Hathor, for instance, were regarded as the eyes of the sun god Re and of the uraeus cobra.[99]

Deities of the Egyptian pantheon whose images are occasionally serpent-bodied and lion headed include Isis, Renenutet, Wepset, and Sekhmet.[100] Mertseger, who, like Renenutet, is primarily an ophidian goddess, appears infrequently as lion-bodied and serpent-headed.[101] It is hardly surprising that the cultic and regal roles of two species are combined in Apedemak (fig. 58), the principal god of Meroe, the city of the Nubian Kushites, who patterned so much of their civilization upon that of the neighboring Egyptians (whom they eventually conquered).[102]

The post-Pharaonic period also has other notable reminders of the continuing importance given to the symbolism of both the lion and the serpent from the earlier periods of Egyptian art. A large number of Greco-Egyptian intaglio amulets of astrological or other magical significance portray a terrifying, leontocephalic serpent-bodied deity known as Chnoubis. The name is believed to be derived from Kneph and equated with Jaldabaoth Sacla, the monstrous serpent-lion hybrid of recently discovered Coptic writings. Kneph, who is authenticated by the Greeks, was the highest deity of certain Gnostic sects of Coptic Egypt and in the cosmology of Thebes was conceived as a creator-serpent, a role that has led to the view that the name is derived from Khamutef (Kematef; also known as Sito or Iru-To), the "Creator of Earth," the "Serpent of the Primeval Darkness," the "Provided of Attributes," who figures in quite early phases of Egyptian theological speculation.[103] References to these qualities also abound in the later periods, but under the name of Kneph. The Sethians and the Ophites, two of the most influential Gnostic sects of the Copts, however, revered no feline. They had a sacred serpent, the rites involving which, as I have noted, "read like a nauseating travesty of the Christian eucharist." Herein, it would seem, lies another hint that the numinous power of the serpent was more inveterate than that of the lion—an animal whose spell on the superstitious (like that of almost all other once-sacred animals) dwindled away in the wake of the social upheavals that marked the disintegration of ancient Egyptian religion.

The lion is insignificant in Greek religion despite the fact that cultural con-





Fig. 57. The Egyptian leonine goddess Sekhmet, with uraeus cobra and solar disc atop her head, 1402–1364 B.C. Temple of Mut at Karnak.

Fig. 58. The Nubian lion god Apedemak, represented conjointly as lion and serpent with human torso and hands, engraved masonry, late first millennium B.C., Lion Temple at Naga, Sudan.

tacts of the Aegean world with Egypt and western Asia stretch back at least to the mid-third millennium B.C. That the lion has religious meaning in Cretan and Greek cults is denied (or ignored as unimportant, very late grafts from Syria) by all authorities on the Minoan-Mycenaean pantheon,[104] though the animal figures very frequently in art. Lions occurred in some parts of the Balkans, but their presence in Greece and Crete in not too remote prehistory is regarded as most unlikely. Lions were rarely, if ever, seen in ancient Etruria (being foreign to the Italian fauna), but nonreligious, "constantly ill-informed" representations of them, inspired by Greece rather than by the living animal, appear in Etruscan art from the late eighth century B.C. on.[105] These observations are of interest for an

eventual theoretical discussion only insofar as they suggest that, though an animal may be awesome in its native haunts and impressive enough to inspire imitative artists, casual knowledge of an unfamiliar or rarely observed species is not sufficient to turn it into a mythically important creature.

Felines native to southwestern Asia apparently failed to elicit, during any period, fervor comparable to that provoked in Dynastic Egypt by the lion. The pertinent archaeological relics of the Near Eastern civilizations date back even earlier than those of Egypt, to about 6000 B.C. In early Anatolia of this period, for instance, in the forty or so shrines at Çatal Hüyük, the bucranium and other signs of an unquestionably strong bull cult are predominant. It is possible that the leopard also was regarded as sacred. A pair of them adorns a shrine, and ex-voto figurines occasionally portray a boy or girl or woman standing behind a leopard or riding one or a seated personage ("goddess"?) giving birth while supported by a pair of leopards.[106] Leopard skins are painted on shrine walls, and carbonized fur and skin found in some male (human) burials are also probably those of the leopard and may have been priestly garments.[107] A ceremonial pressure-flaked obsidian knife (clearly of ritual importance) with an elaborate handle in the form of a serpent also occurs in burial contexts.[108] Serpents are not conspicuous in the art of Çatal Hüyük, and even leopards, as James Mellaart[109] notes, are rare. They seem to describe the attributes of the deity rather than identify his alter ego. The distinction between the venerability of an animal and its merely heraldic value, however, is quite indistinct in early Anatolia, particularly since inscriptional evidence like the Egyptian is lacking.

This is also partly true of certain artistic relics of the Early Neolithic period of Mesopotamia. Here, however, the existence in later times of anthropomorphic divinities of Assyria-Babylonia whose Sumerian origins and well-defined characteristics are revealed in cuneiform writing mitigates the problems of identifying divine animal symbols. Still, it is impossible to ascertain, for instance, whether Marduk, the chief national god of Babylonia, whose name appears to mean "bull calf of the sun" (though he has no special solar features),[110] was initially deified in bovine form alone, or whether Ningishzida, who almost invariably is represented with a serpent springing from each shoulder, is derived from the deified, archetypal serpent. Animal figures painted on pottery and pictographic signs of them from the Tell Halaf period (ca. 4500 B.C.) include hardly any feline motifs, though those of serpents, birds, and several quadruped animals such as the bull (bucrania) are very frequent.[111] Numerous species are represented in the protohistoric stamp seals excavated from sites such as Tepe Gawra, Nineve, Tell Brak, and Arpachiya of the al-'Ubaid Period (ca. 3800 B.C.). The exact purpose of depiction is conjectural, but caprine, cervine, and bovine motifs are consistently predominant and continue to be so up to the end of the millennium. This is consistent with the circumstance that at these Neolithic settlements agriculture, involving the domestication of wild animals, was assuming increasing importance.

D. Homès-Fredericq's illustrations and analysis of animal motifs on these protohistoric Mesopotamiam stamp seals reveal only an occasional lion (or other feline) in the company of, or attacking, caprids and bovids—probably the reflection of a concern normal to early herdsmen. The serpent, too, occurs in similar scenes but much more often, sometimes together with humans. One interesting example, possibly an apotropaic amulet that seems to seek protection for the

wayfarer, shows a pair of human footprints pointing in opposite directions with a serpent's body between them.[112] In an almost similar seal, the footprints are replaced by two caprids. The lion motif (unrelated to this theme) appears for the first time during the Uruk (or Warka) period, no earlier than 3400 B.C., whereas serpents (also scorpions, birds, fish, and the usual caprids and bovids) are known on stamp seals of the al-'Ubaid period at least a half-century earlier.[113]

Sumerian texts refer to the goddess Inanna as "the protectress of the flocks." However, she had not only caprine, but also feline and ophidian aspects. Indeed, we have noted above hymns in which she is given the epithet "serpent." Feline/ophidian ambivalence is evident in two early Mesopotamian objects. The first, an important steatite vase bearing the inscription "Inanna and the Serpent," shows in low relief a combat between a rearing serpent and the goddess in the form of a lioness (or leopard). It is not clear whether this scene merely reflects a pitting of the lioness's proverbial bravery against the serpent's death-dealing venom, but, in the second object, a cylinder seal, the serpent clearly "dominates" the lioness (fig. 59). The animals involved in its theme are those which are chiefly associated with Inanna (or Ishtar, or Astarte), especially in her aspect of Venus, and here they symbolize nocturnal-diurnal cyclicity—first, by the killing of the (nocturnal) antelope by the goddess as lioness, the latter, in turn, killed at daybreak by the goddess in her aspect of celestial serpent. In addition, the reappearance of the antelope and of Venus, as star, are indicated. Sumerian texts that invoke various divinities through animal metaphors very frequently refer to feline ferocity, fearlessness and indomitable strength in battle, and frightening roars. It is significant that these metaphors also invoke the serpent's qualities: "As a ferocious lioness you [i.e., Inanna] extinguish with your venom the life of those who are non-compliant." A lion's eyes are not merely fearsome—they are "yellow, serpent's eyes."[115]

The protohistoric stamp seals of Mesopotamia gradually gave way to cylinder seals that continued to elaborate more and more on themes utilizing caprine, bovine, ophidian, scorpioid, leonine, or other animal motifs. In the transitional Uruk and Jamdat Nasr periods (up to ca. 2900 B.C.), the cylinders depict scenes of fantastic hybrids with feline bodies and serpentine necks that terminate either in a serpent's or a lion's head. These creatures often face each other with their necks intertwined much like those of similar fantastic hybrids engraved on the famous Narmer Palette from Egypt.[116] Probably used as owner's identifying marks on stored grain or other property, cylinder seals exhibit many obviously secular themes that are decorative or heraldic or whose religious content seems thin, though many others undoubtedly refer to a myth or a divinity. "Hero" and "confrontation" scenes are frequent—the hero may be grappling with or stabbing a lion, a bull, or a mythical bull- or lion-headed anthropomorph, perhaps demoniacal. About animals seen on Babylonian cylinders of the Second Early Dynastic Period (ca. 2700–2350 B.C.), Henri Frankfort observes that "they still present to a large extent variations upon a single theme. Their subject is, in essence, the defense of flocks and herds against beasts of prey, especially against lions, but this is rarely presented in a straightforward manner. . . . On the whole, the facts of the situation, which must have been a commonplace of daily life, are taken for granted, and the seal-cutter gives full rein to his inventiveness."[117] The hero is also occasionally depicted holding (lion-headed) ser-

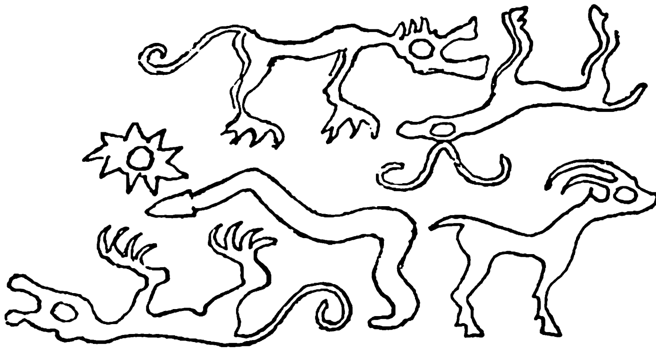
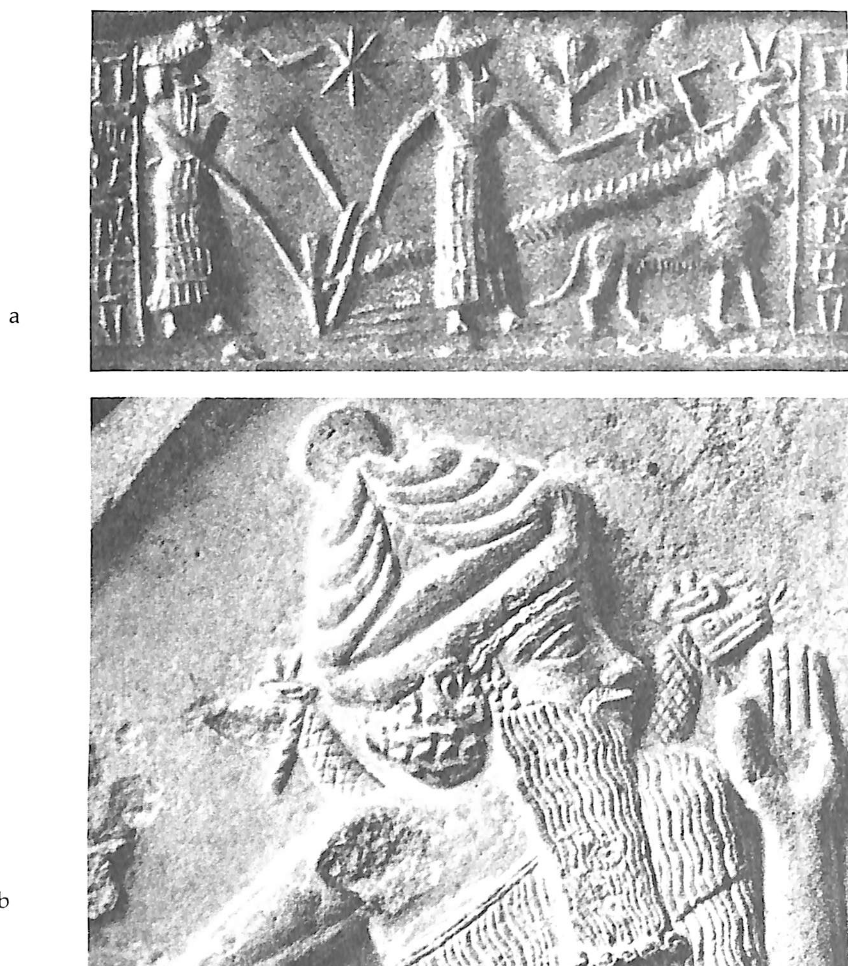


Fig. 59. Schematic representation of a Mesopotamian cylinder-seal impression concerning a cosmic myth, predynastic period, fourth millennium B.C. The antelope of the night is killed by the lion-star of the morning, seen behind the figure of the lion. The latter, in turn, is killed by the serpent at daybreak. The star illustrated is common to these celestial episodes, which, however, involve no extinction of the serpent. Lion and antelope reappear in the cycle at appropriate junctures. All three animals are the attributes of Ishtar and her equivalents in other Semitic religions.

pents by their necks. Sometimes, sheep's tails are portrayed as long, serpent-like, and terminating as scorpions. Representations of deities are not common on Early Dynastic cylinder seals, and it is difficult, continues Frankfort, to distinguish them from human beings. However, when the gods are evident (from the horned crown conventionally worn by them), their most conspicuous animal companions are generally of the dangerous variety: the quadruped that generally appears with the sun god Shamash's boat is the lion (or a human-faced, leonine-bodied monster); the stern of the boat sometimes ends as the head of a serpent, or the divine occupant may be accompanied by an elaborate serpent-coil design; or scorpion-men—"awful in terror . . . their glance death . . . the wardens of Shamash," in the words of the Epic of Gilgamesh—sometimes precede Shamash's solar boat. These three animals also recur in an agricultural scene in which a scorpion-handed personage (Shamash in fertility role?) led by a lion tills with a plow that has the form of a horned serpent whose headdress bears the two short horns which are the attributes of the Mesopotamian divine crown (fig. 60). The other deity prominent on the seals of Early Dynastic times (who, indeed, appears even on those of preceding periods as early as the Uruk) is Ningishzida, the original form of whose symbols during that period consisted of a pair of copulating or intertwined vipers. In the Second Early Dynastic Period these often appear as elaborate serpent coils, sometimes with heads whose ears are like those of a lion.[118]

While the lion and the serpent, sometimes as winged dragon, appear independently or as symbols of Shamash and occasionally of other gods like Adad, god of thunder, it is not customary for Mesopotamian deities to monopolize a particular animal or animals. In addition, fantastic hybrids like the lion-fish and goat-fish may be connected with several gods, and, though styles change continually during the long history of Mesopotamian cylinder seals, only a very few animal species are represented recurrently. The Assyrian style, used throughout



a

b

Fig. 60. Cylinder-seal impression showing a scorpion-handed Mesopotamian agriculturalist (believed to be the sun-god Shamash), preceded by a lion, tills a field with a serpent (or horned dragon) pulling the plow, Dynasty of Akkad, mid-third millennium B.C.; *b*, the agricultural fertility god Ningishzida and his ophidian attributes, from a Sumerian stele, 2200 B.C.

Mesopotamia beginning ca. 1100 B.C., employs the same zoomorphs as those of preceding periods—stylized bovine, ophidian, feline, and caprine forms—in themes involving their confrontations with heroes and adoration of deities mounted on mythic animals. It is difficult to say which species is the most important or conspicuous one. However, it is not leonine but ophidian creatures around which a fundamental societal myth is built—that of Creation and the Flood, involving the conflict with, and destruction of, the forces of evil represented by the serpent Tiamat and her brood—which comprises one of the most concrete themes in art (fig. 61). Prominent among the deities are their ferocious "sacred" mounts—benign ones such as horses are hardly seen. Adad, conspicuous among the male gods, sometimes rides a bull and sometimes a fire-spitting dragon with a scorpion tail; Marduk, the national god of Assyria, also has a



Fig. 61. Depictions of episodes from the Babylonian creation epic *Enūma eliš*: *a*, scene on the 'Ain-Samiya goblet, said to be the earliest known artistic evidence of a proto-version of the epic, in which the god Marduk (left) repulses the fearsome, malevolent serpent deity Tiamat with the aid of "a plant to put out poison" while his henchmen (right) enmesh her (symbolic sun-rayed face) in Marduk's net; *b*, scene from the Khafaje plaque, early second millennium B.C., recently reinterpreted as the sequel to the 'Ain-Samiya goblet theme, clearly showing Tiamat's scaly skirt, ophidian gastrostege scales (?) delineated beneath her breasts, and sun-rayed face; *c*, cylinder-seal impression, Neo-Assyrian period, 912–612 B.C., depicting the slaughter of Tiamat by Marduk.

dragon mount, as do Nabu and Ishtar. The latter may also be seen astride a lion[119] or the hybrid monster *muš-huš*.

While there are references in the literature to "snake-gods,"[120] I have come across none to a lion god, despite the seemingly equal symbolic importance given the two animals in Mesopotamian art. Heimpel's focus on the numerous animals that command attention in cuneiform texts (including those which rarely if ever figure in glyptic or other art) reveals this clearly.[121]

Still, it would seem difficult to speak of felines as deities in the same sense that the serpent was the ancestral form of the anthropomorphic god Niraḫ, Ningishzida, Ishtaran, Kadi, Sirsir (?), and perhaps others. In western Semitic religions, too, especially the Ugaritic and the Canaanite, the deities—for example, Shan, Astarte, Babi—had very strong ophidian aspects or attributes, some

deities, like Astarte, being modeled on those of the Sumero-Assyrio-Babylonian pantheon, but they include none that were closely, or principally, identified with felines.

Throughout the Near East the customary offerings made at the sacrificial altar were domesticated animals such as bull, sheep, or goat, and their semiwild progenitors may have served this need in the incipient Neolithic farming communities. At the White Temple at Warka (Uruk), the Sumerian capital, excavations revealed evidences of offerings and incense burnt on a pedestal in a sequestered part of the foundations dating to the early third millennium B.C. (Jamdat Nasr period). "Bones of what probably were a leopard and young lion had been placed . . . in a rectangular box-like depression in what seemed to have been a foundation sacrifice."[122] This practice appears to have been unusual, however, since, in the iconography of temples, felids have heraldic but no apparent numinous character. The Painted Temple at Uquair (Uruk period, ca. 3300 B.C.), for instance, has a pair of enormous leopards painted on the two walls along the steps leading to the altar.[123]

Felids had no importance in religious observances which were very deeply rooted in Mesopotamian mythology. The *akītu* festival, held annually for over two thousand years from at least the mid-third millennium B.C. on, is an example. Its details varied in different cities of Babylonia and Assyria, but the central theme commonly involved rites of *hieros gamos,* signifying the renewal of the forces of nature governing agriculture and triumph over evil and chaos. The latter idea, of course, is contained in the most important cosmogonic text, *Enūma elish,* the Babylonian Epic of Creation, the stimulus for which harks back to the Sumerian flood myth and the evil creatures of Kur. In *Enūma elish* primeval chaos is represented by the demoniacal Tiamat, Apsu, and Kingu, "monster-serpents, sharp of tooth, unsparing of fang. . . . with venom for blood."[124] One Babylonian commentary text on *akītu* rites speaks of the burning up of Kingu. Another mentions a sacrificial bull (ironically, named Kingu) which "is thrown live into bitumen." In addition, it speaks of cleaving a sacrificial pigeon (named Tiamat) into halves during an enactment of the myth of the god Marduk's battle with and cleavage of Tiamat. The defeat of demoniacal serpents was so significant an element in *akītu* rites that the Assyrian emperor Sennacherib, in the guise of the god Assur, played victor over Tiamat in mock fights staged for the cultic drama.[125] Another important text on rituals describes precise details of manufacture, materials for, and the iconography of two small idols each of which was to be represented with hands upraised in obeisance to the god Nabu, son of Marduk and often his substitute. Both idols, one holding a serpent and the other a scorpion, were intended for ceremonial breaking and destruction by fire during an early, preparatory phase of the eleven-day festivities.[126] Even in a purely literary text with little or no religious function, the Epic of Gilgamesh, which incorporates its own episodes and versions of the flood myth with roles both for the lion and the serpent, it is the latter that is obviously the villain of the piece.[127]

In the religion of Elam, Mesopotamia's neighbor on the western Iranian plateau, sharing many artistic traditions stemming from their close cultural and societal links, felines are completely overshadowed by the serpent. That it was the leitmotif in priestly activities is amply clear from archaeological relics and, to some extent, from inscriptions.[128]

To summarize the status of felines in African and Asian thought: The

Balonda of east-central Africa, the ancient Egyptians and Kushites, and the pre-Islamic Arabs (whose pantheon includes a lion god, Yaghuth, besides at least three well-defined ophidian ones)[129] seem to be the only notable examples of peoples who worshipped clear-cut feline deities. The available information suggests that the powerful nature of feline animals and perhaps their occasional depredations were a cause for concern to some early agricultural societies; that their numinous importance in most regions is not at all so extraordinary that the serpent's suffers by comparison; and that the reputation of felines as ambivalent symbols of supernatural benefaction or malevolence is generally far less than the serpent's.

In the Western Hemisphere, where felids competed for attention in certain regions with another "dangerous" species, the bear, puma and lynx were once widespread but have conspicuously little or no religious significance compared with the more range-restricted jaguar. This point is one of some importance, since eastern Siberian attitudes towards animals, including bears and felids, had the potential of being perpetuated in North America once they were transmitted across the Beringian landmass that linked Asia and America in geological history. The jaguar deserves special mention, for in the heavily forested and adjoining regions it shares with certain sociocultural groups of Mexico, Central America, and western Amazonia, including the Andean foothills from Colombia to Bolivia and Peru, an extensive body of secular myths about the animal merges with shamanistic rituals.

It is doubtful that in prehistoric periods jaguars were ever as populous or obtrusive as reptiles. Their distribution, haunts, and almost exclusively nocturnal habits probably made encounters with them quite infrequent. There is no doubt, however, that the jaguar's roars, especially at mating congregations, can be as unnerving as the insidious silence of the reptile, as tribal people freely admit.[130] However, the nature of shamanism, centering as it does on a variety of animal familiars each in its own way significant in tribal world view, though some are more popular than others, necessitates careful evaluation of the relative importances of felids and reptiles as "deities"; these may at times be nameless in animal form and hard to recognize as such, though the invocation of their power to grant boons seems to qualify them for no less than divine status. In these contexts the jaguar and the serpent are outstanding among the many animals that figure not only in folklore and the zoomorphic subject matter of the art of exremely primitive tribes, but also in the religious monuments of their ethnic confreres in the major ceremonial centers of the high civilizations of pre-Columbian America.

According to Julian Steward and Louis Faron, the primitive Mojo of eastern Bolivia honor the jaguar "as an important god . . . [a] central deity of a special cult . . . The ritual of the jaguar cult [practiced] in a special house or temple built cooperatively by all the men of the village . . . [employs] human trophies, jaguar skulls and paws, and sacred musical instruments. . . . The temple was appropriately called a 'drinking house' since a principal ceremonial act was a heavy drinking of chicha as a libation to the deities."[131] The term "deity" for jaguar seems warranted in this particular case, but G. Reichel-Dolmatoff, Irving Goldman, and Rafael Karsten, despite their intimate knowledge of jaguar cults over an extensive area of Amazonia, refrain from such usage without, of course, detracting from the great importance of the jaguar. They document in detail the recurring allusions to it in metempsychic beliefs, myths of creation, and sexual,

astral, and other superstitions with a wide range of connections to daily life in the forest and the shamanistic needs of the various tribes of Colombia and Northwest Brazil. What is relevant for our purposes is that each also stresses the recurrence of the venomous serpent, the anaconda, and the boa in precisely the same roles as the jaguar's—terrifying roles almost always denied to other species.[132] Fearsome creatures surface lucidly in oral accounts and in the artistic designs Colombian Indians paint on hut walls, posts, loincloths, and other effects when they are under the hallucinatory influence of the drug *ayahuasca*. Reichel-Dolmatoff's photographs of these patterns reveal mainly sinuous, serpentine lines, spots (reptilian? feline?), bifurcations, and explicit representations of serpents and the jaguar.[133]

One may usefully explore the extent to which these two animals appear either jointly or as interchangeable symbols and whether, on balance, it is possible on a hemispherewide rather than a local level to discern which of them has had the greater impact on the human mind in shaping cults.

A detailed analysis by Daniele Lavallée of the animal motifs painted on pre-Columbian ceramics of the Andean Mochica gives a good idea of their maker's preferences. "Realistic" (secular?) representations of felines easily outnumber the ophidian, 190 to 55, a clear indication of the popularity of the feline motif. On the other hand, there is a group of pots with paintings of supernatural themes showing ferocious beings, both zoomorphic and anthropomorphic, and typified by a "demon-au-serpent." One of the features of this is its fangs (sometimes the only feline element noticeable, if indeed it is feline), but the variations are many: the mouth most often has a bifid tongue, the supernatural being may be borne inside a boat in the form of a centipede, may have plants for hands, etc. In any event, an almost invariable and emphatic feature of the "demon-au-serpent" is the reptilian emblems that form an aureole around him or adorn the ends of his boat. Though this theme surpasses in frequency that of the feline-monster 123 to 76, jaguar and serpent seem inseparable in secular motifs, especially of the Mochica of A.D. 300–900.[134]

The monumental art, pottery, and textiles of the Bolivian altiplano and Peru, particularly from the Late Formative (300 B.C.) to the Tiahuanaco-Huari (A.D. 1200) period, abound in zoomorphic motifs—mainly feline, ophidian, and avian—characteristically presented as artistic hybrids that often also incorporate human features. The culture hero or deity (?) Ai-Apaec of the Mochica and Chimu cultures frequently exemplifies this. In art, Ai-Apaec is an anthropomorph, often but not necessarily portrayed with a feline mouth and fangs. In the simplest works that represent him as fully anthropomorphic, his most outstanding emblem is the serpent, often doubled-headed, which he normally wears as a belt and in his headdress (fig. 62).[135]

The obviously decorative use of hybrid zoomorphs is so common in Andean art that archaeologists wisely refrain from applying the term "deity" too liberally, but the central, large figure of a dwarflike personage on the Sun Portal at Tiahuanaco, Bolivia, can arouse little scepticism in this regard (fig. 63). Its head radiates jaguar-headed serpents (which may be longer-bodied and sometimes alternate with, or are replaced by, condor heads in other similar works of art of this period, ca. A.D. 800–1200). The ornaments and platform repeat the motifs of condor- and jaguar-headed serpents. Full-bodied serpents are prominent in the pectoral and in the center of the platform. His most characteristic symbol, how-



Fig. 62. Andean depictions of an ophidian-feline personage, probably the divine culture hero Ai-Apaec. *a* lacks feline symbols; a demon, rather than Ai-Apaec, seems to be the subject of *d*.

ever, appears to be the pair of scepters in the form of reptiles with condor, not feline, heads. In view of the importance of the sun in Andean mythology and the occurrence, at the time of the Spanish conquests, of an undoubted sun god, Inti, it is perhaps not unreasonable to regard the figure on the Sun Portal at Tiahuanaco as a divinity or at least a semidivinity whose attributes reflect the differing emphasis placed on different animals.[136]

One of the animals that symbolizes the Andean sun cult and perhaps is conceptually linked to a deity who may have had human form is of course the gigantic condor. A gold pectoral from the ruins of Pachacamac illustrates once again the synthesis of avian, feline, and ophidian traits (fig. 64*a*). Julio Tello regarded this image as a representation of the "condor god," rather, as a transformation of the "feline deity." He described its feline mouth and nostrils and particularly noted the two highly stylized serpents that form part of the condor's crown.[137] The quadruple jaguar-headed serpents that comprise the wings and tail and the delineation of serpents' ventral scales are obvious.

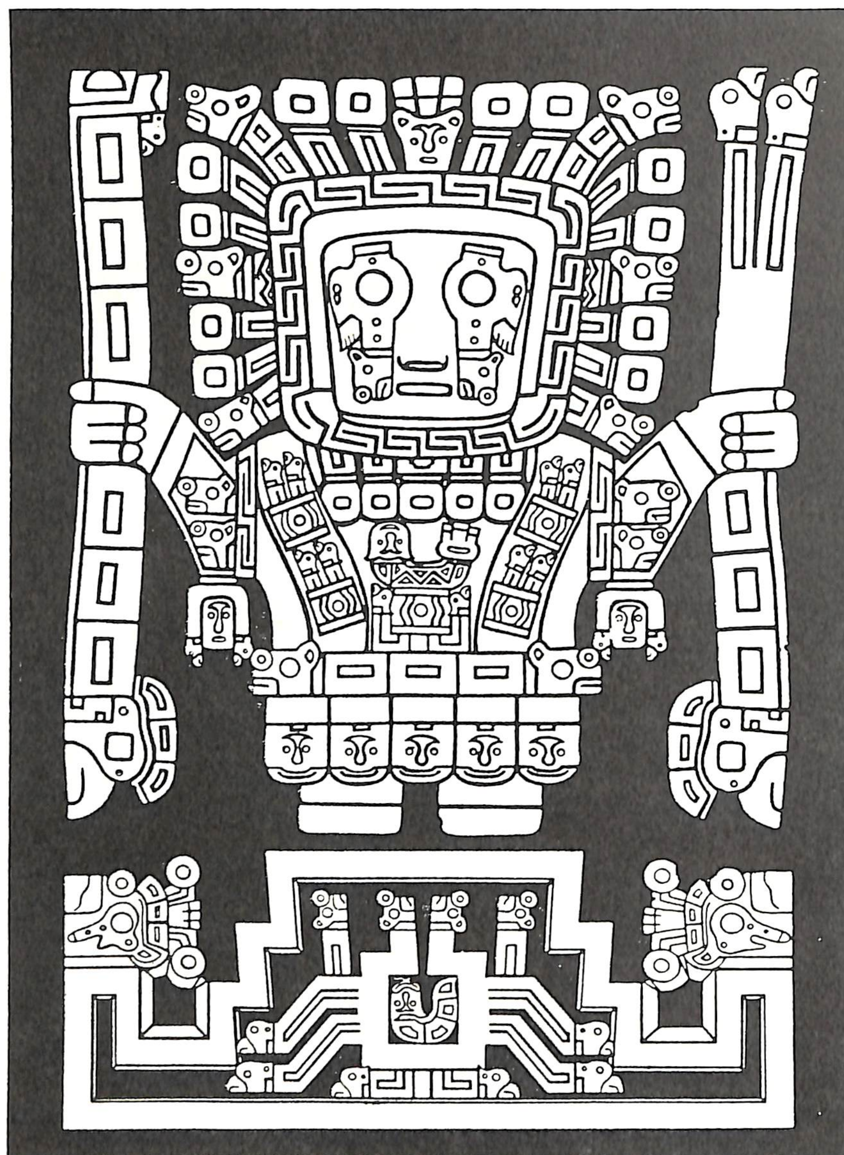


Fig. 63. The focal subject engraved upon the Sun Portal at Tiahuanaco, Bolivia, ca. A.D. 900–1000.

The jaguar is subordinate in or absent from one of the simplest yet most powerful representations of a rayed sun face, almost certainly a sun deity's (fig. 64*b*). Carved in low relief on a monolith from Chiripa, on the Bolivian altiplano, it belongs to a quite widespread substyle (known as Asiruni) in which an abbreviated human form "is most significant, at least as reflected in area covered. Next, or perhaps of equal significance are zoomorphic elements . . . the most important of which is the serpent, then quadruped. Serpents are frequently double to triple the number of personages on any one piece."[138] The quadrupeds on the Chiripa monolith are llamas. The serpents, represented with plain, triangular heads, clearly symbolize the four cardinal directions—four of

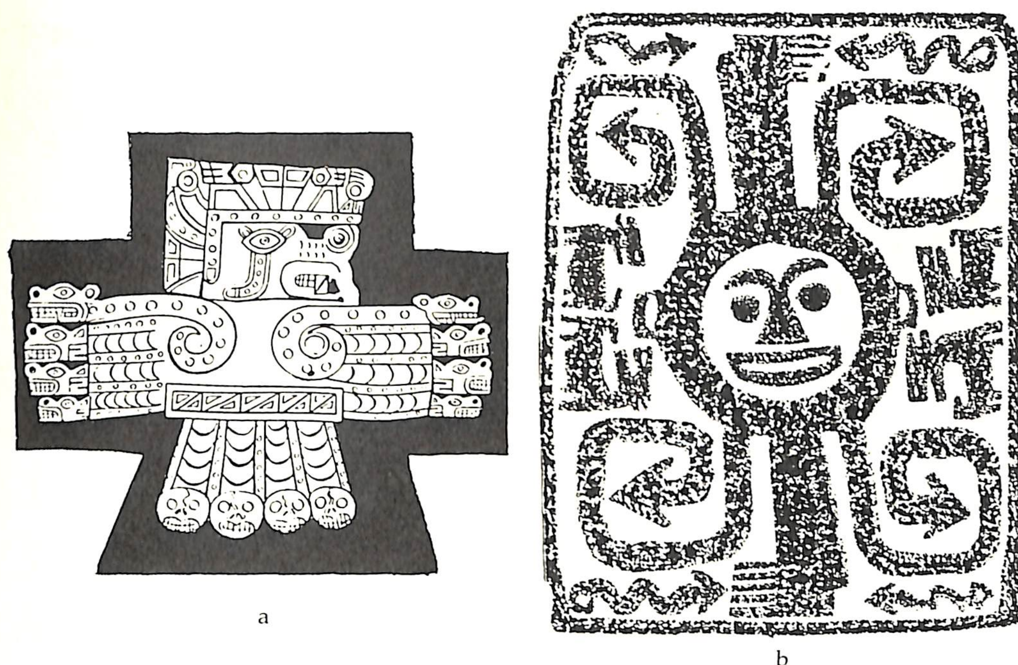


Fig. 64. Solar and ophidian symbols in Andean cultures: *a*, the condor-god, who incorporates avian, ophidian, and feline characteristics; *b*, a monumental stone slab from Chiripa, Bolivian altiplano. Serpent symbols denote East and West, both at the four corners and as rays emanating from the sun face; the quadrupeds seem to be llamas.

them issue from the sun face like rays and four others, at corners, represent the four quarters of space—but in other very similar monoliths bifid tongues issue from triangular heads. In still others, the entire stylized monolith (fig. 65) represents a serpent with tongues, represented as spirals, while the triangular projections may or may not represent the ears of a quadruped. The point is that the feline motif is scarcely emphasized in these monuments, which are cultic rather than merely ornamental. S. G. Chávez's detailed studies of these (ca. 200 B.C.) styles and abundant photographs of Bolivian and Peruvian stelae make this quite clear.

Since feline motifs are undoubtedly important in the decorative art of the Andean region, it is desirable to estimate the weight originally given to the feline vis-à-vis the serpent in *religious* beliefs of far earlier periods than those from which all the above examples are drawn. For clues from the pertinent relics, no known site is more relevant than Chavín de Huántar in west-central Peru. Belonging to the Formative period, its art has been acclaimed as determinative in the styles of later cultures far removed from the site. No known Andean relic is of greater or more obvious religious significance, or older, than the one called El Lanzón, discovered at Chavín (fig. 66).[139] Other animals, such as birds, are also represented at the Temple of Chávin de Huántar but apparently are decorative and positioned mainly at portals, away from El Lanzón.

Engravings of serpents, jaguars, birds, and hybrid forms are common enough elsewhere at Chavín, but most of them belong to later periods than El

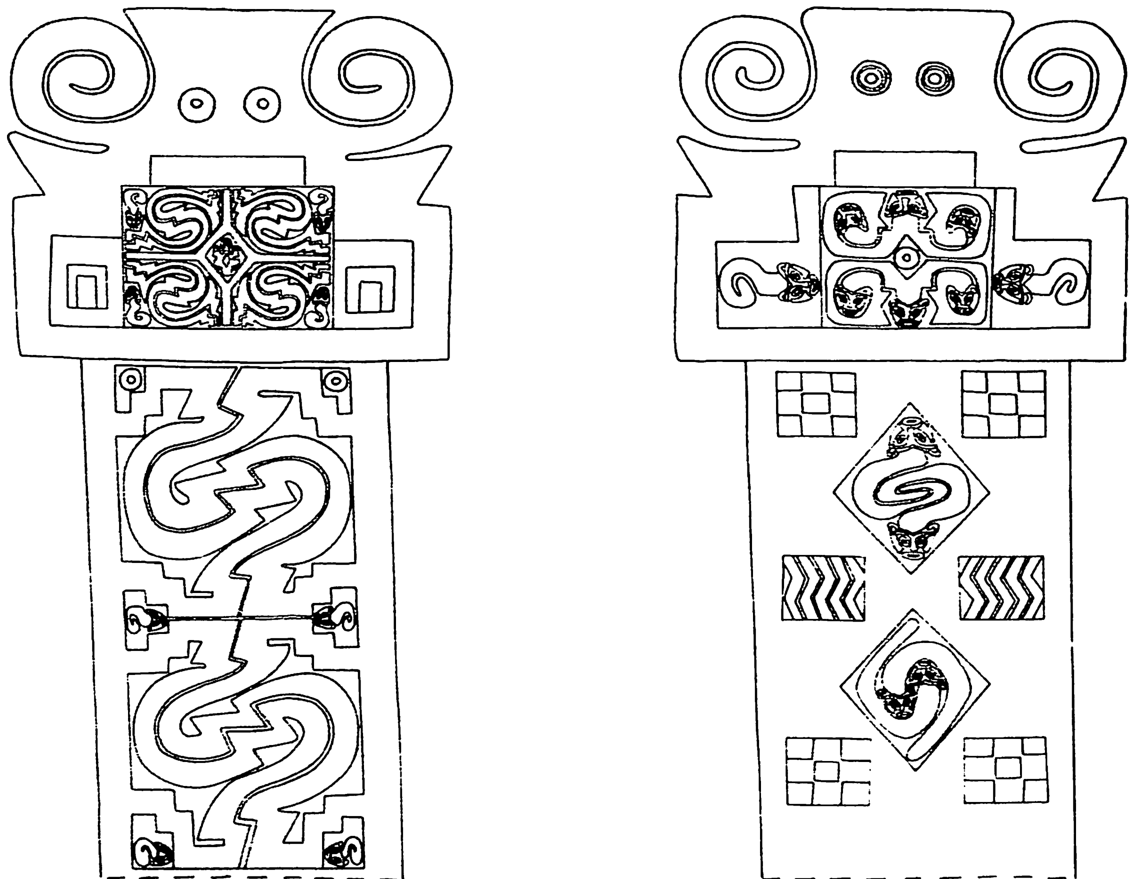


Fig. 65. The Pucara plaza stele, front and rear views of its highly stylized serpent symbolism. The earlike involute processes may represent a bifid tongue, a deity's arms(?), or rays like those in figure 64*b*. Some may detect "tadpole," "frog," and "feline" symbols, but these are unlikely, since the cult practices represented by the Pucara stele and the Chiripa sun face were essentially alike.

Lanzón, which dates to ca. 1200 B.C. A stone idol measuring 4.53 meters, its special aura derives from its location in a narrow subterranean gallery, exactly in the center of a U-shaped edifice, and from the fact that it faces east, towards the rising sun. Shaped like a thick knife blade with a short handle, it is partly antropomorphic and partly zoomorphic. There is a groove in the "handle" running into a cup over the head (for sacrificial fluids?). From the torso downward it has a strangely ophidian suggestiveness. It tapers into a rough cylinder as it approaches the ground, in which the lowest part is buried. In at least one previously published sketch of this monolith (fig. 66*a*), the rear surface of this lowest section possesses almost imperceptible engravings of a serpent's ventral scales, much like those seen in the wings and tail of the condor god already described. A feline countenance is surmised by many who are impressed by El Lanzón's highly stylized features, but the question of the influence of subjectivity arising from one's awareness of the jaguar motifs elsewhere in Chavín and other Andean art is a neglected one; the fangs could be feline, ophidian, or

neither and may merely suggest the frightful power of the deity incarnate as El Lanzón. Why is this idol not a quadruped like so many other, lesser, decorative feline motifs in Andean art? At least, why are feline bodily characteristics so little emphasized? If the jaguar were a dominant cultic animal, why is this not more apparent in El Lanzón? These questions are difficult to answer on behalf of its ancient worshippers. Of real significance, it seems to me, are these features: (1) its general form, which approximates that of a rearing serpent (the only clearly humanoid traits occur in the ringed earlobes and feet, even human arms being lacking); (2) the subterranean setting, befitting the chthonic functions usually attributed to the serpent; (3) the characteristically ophidian ventral scales (arrow, fig. 66*a*) at the base of the idol; (4) the belt suspending a pair of serpents at the back of the idol; (5) the hairs in the form of serpents (which, as in some other examples at Chavín, do not have ears, in sharp contrast to the feline-eared serpents common in the art of later periods such as the Mochica); and (6) the eastward orientation mandatory among sun cultists, the ophidian symbolism being as transparent as in the sun faces on the Asiruni-type monuments already discussed. The sun cult, in brief, argues far more for the serpent than for the jaguar as the animal that had left an impress on people destined to create the art of the formative periods of Andean civilization.

To fortify this view we may briefly point to recent excavations at Kotosh, not far from Chavín de Huántar. The importance of the Kotosh finds is that they predate the earliest, formative Chavín culture by about three hundred years. They also confirm previous data regarding the absence of classic Chavín-style designs in the earlier phases of Kotosh culture. The representations of fangs which characterize the Chavín feline motif are not recognizable at Kotosh, though at a later period there are other undoubted Chavinoid influences in Kotosh ceramics, which include a number of anthropomorphic idols of clay.[140] Their faces have only a broad, depressed band to show the mouth, which is plain and definitely nonfeline. Large quantities of deer and, especially in the Chavín period, llama bones were discovered, suggesting that the llama was being domesticated in the earliest prepottery period (radiocarbon-dated to earlier than 3,800 B.P.), though apparently it attained sanctity and association with the sun god only much later. A double-headed serpent is reported on a cotton textile from Huaca Prieta of the third millennium B.C., and there is a painted serpent on a stone wall of the preceramic Mito period (probably 2000–1500 B.C.) at Kotosh.[141]

It seems to me most significant that man and serpent are intimately linked in a relic from the Sajara-patac period of Kotosh, when neither obviously Chavín-influenced designs nor feline motifs are recognizable, for, according to excavation reports, anthropomorphic designs on ceramics of this period are "very rare, but the one representation of a human figure holding snakes is notable."[142] Thus the antecedents of the decor on ceremonial ceramics of Chavín yield clues, if not proof, of the identity of El Lanzón's fangs. The oldest of these ceramics (Rocas group) includes one fragment of a stirrup-spout goblet with a low-relief, stylized feline or ophidian head— it is difficult to say which; other specimens leave no doubt that the engravings on them are of bifid tongues and realistic, undulating serpents (and reptilian scale surfaces?). In the next (Transition) phase occur simplified patterns of stylized heads with two fangs—again of questionable identity—but representations that are recognizably feline mythic winged monsters are not seen until the succeeding (Ofrendas) phase.[143]

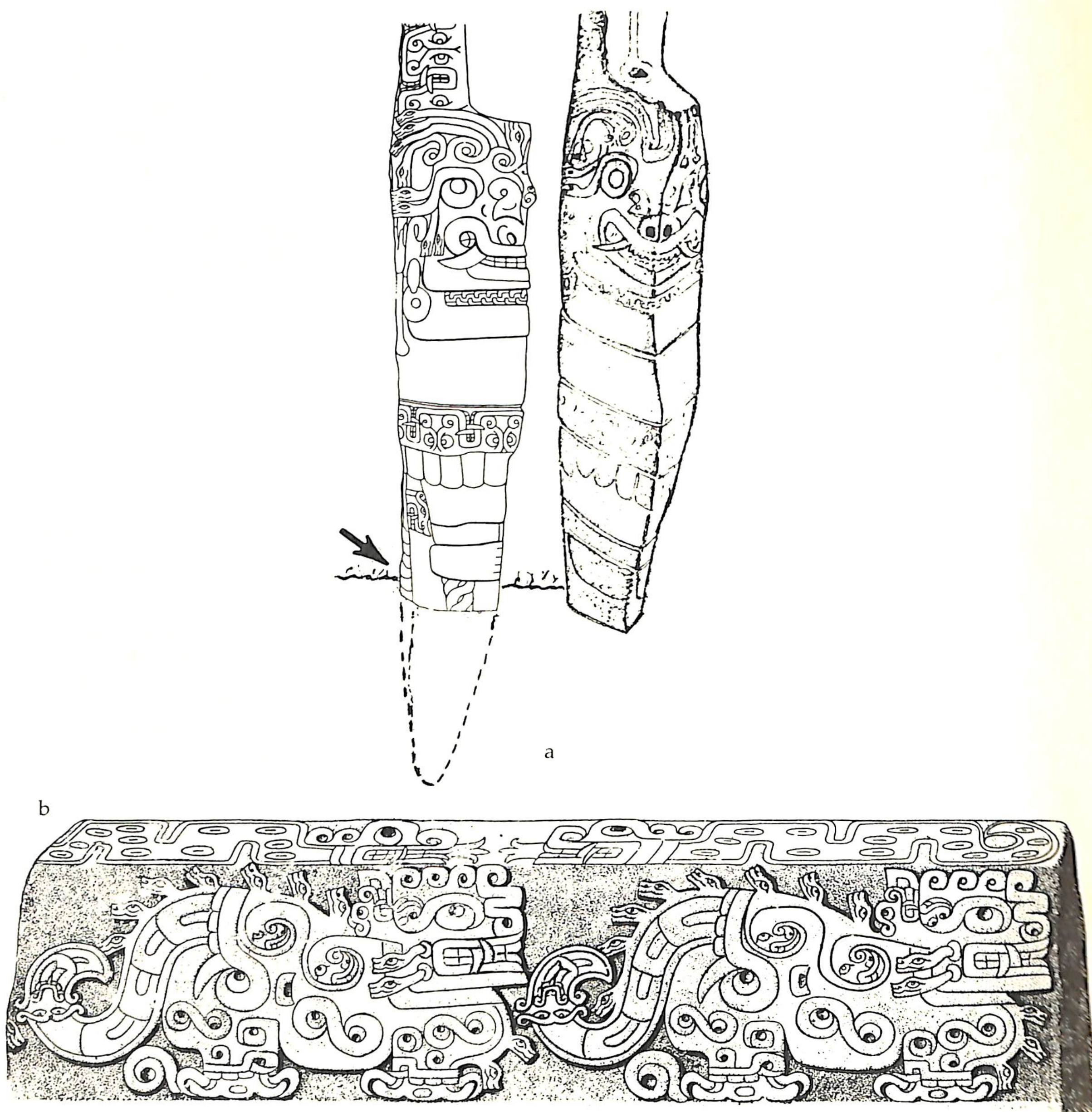


Fig. 66. *a*, the diety El Lanzón, and *b*, a decorative frieze, pre-1200 B.C., Chavín de Huántar, Peru.

All these factors seem consistent with the Peruvian archaeologist Federico Kauffmann Doig's assessment of zoomorphic elements in the Formative period of Chavín art: "Representations of the jaguar are rare in the lithic art of Chavín . . . individual or preponderantly feline representations are exceedingly scarce. . . . The serpent occurs in many cases, and frequently its mouth with fangs, sometimes with a single fang in front [in profile], has superficially been taken for a feline mouth. Andean myths (coastal and highland) revolve especially around birds and serpents, and [only] secondarily around felines as we see in . . . Chavín iconography."[144]

Is this information from South America (signifying the need for caution in awarding the jaguar more than its due share of importance in religion) relatable to Mesoamerica? Some, struck by resemblances between the art of one of Mesoamerica's earliest seminal cultures, the Olmec, and that of the Chavín, see indications of religious or ethnic affinities between their civilizations.[145] One aspect of this is their stylized, chimerical zoomorphic art, which emphasizes mouth and fangs. The danger that abstract renditions of these will mislead one into identifying them as feline is greater in Mesoamerica and necessitates rather more detailed treatment than in the examples given heretofore.

Naturalistic portrayals of the jaguar are legion in Mesoamerican monumental art of all periods and in murals, ceramics, the symbolic imagery of the calendar, and the codices of the late first to early second millennium A.D. It is, however, the subjectivity involved in interpreting stylized art that creates problems, particularly affecting the little-known religion of the Olmecs, whose art can also be deceptively simple. Many of their anthropomorphic sculptures have been identified by some as "jaguar-like" or "jaguar-faced," though they lack indisputably feline morphological characteristics comparable in uniqueness or ease of recognition with the rattlesnake's rattles, tongue, and ventral scales. Were they, in fact, modeled upon the jaguar, and was this animal feared and held any more sacred than the serpent? Superstitions about *nahuals* and *chaneques*—ferocious jungle spirits in the form of werejaguars, wereserpents, and other animals that possess and torment people—are deeply rooted in many parts of Mexico. Any species in such a role is a candidate for our eventual theoretical discussion of elementary fear as a possible stimulus for venerating it. The point at issue, however, is one concerning *relative* cultic importances, for the belief has long been nurtured that the cult animal par excellence of the older phases of the Olmec and perhaps of the coeval Zapotec culture is the jaguar and not the serpent, though the involvement of the latter is not denied. How accurate is this belief?

With Carlo T. E. Gay and Karl W. Luckert, I incline to the view that it unjustly, or unwittingly, depreciates the serpent. However, Luckert holds that "what has not been proven to [his] satisfaction in the published reports is the assertion that there was a jaguar cult among the first agricultural Olmecs"—a moot claim weakened by his and Gay's often insecure foundations. My own previous writings champion the ophidian, not the feline, as the one common, forceful element that surfaces amidst the great variety of animals in Western Hemispheric myths and religions. It is quite probable that the weight of prestigious names in Mexican art history and archaeology partly accounts for the perpetuation of a fundamentally questionable interpretation of early "jaguar" motifs.[146] The diversity of serpent/dragon motifs in Olmec art has recently been surveyed in an admirable study by Peter David Joralemon.[147] I shall soon seek support from findings like his but must now convey a few thoughts, some of them new, mainly for the purposes of the concluding chapter on the "meanings" of animal symbolism.

According to Ignacio Bernal,

> Covarrubias has demonstrated the stylistic evolution of the Olmec jaguar to the rain god—Tlaloc, Cocijo, Chac, or Tajin—in later cultures. Caso has also called the Olmec jaguar "a god who is probably an ancestor of Tlaloc." But the Aztec Tlaloc is no longer feline; fundamentally his nahual is the serpent. The jaguar of the hot low-

> lands does not represent Tlaloc in the highlands, and this evolution seems to occur also in other cultures. This means that there was some change or rather a different emphasis in the component parts of the animal associated with the deity of rain; *the serpent element, very weak in the beginning* [my italics], later prevailed.

Bernal adds in a footnote concerning a certain figurine that "we seem to be dealing precisely with the jaguar which was taken to Monte Albán by the Olmecs."[148] I wish to question the accuracy of the italicized sentence, which reflects the trend-setting sentiments of Covarrubias and Caso. It is not my intent to play down the frequency of indubitable feline motifs; I merely want to show that the influence of earlier views is in part responsible for the insufficient weight given to the ophidian symbols that almost always occur in portrayals of hybrid zoomorphs, among which the jaguar is but one of the four animal species used as a model in Olmec art.

Monument 6 from La Venta, on the Mexican Gulf Coast (fig. 67), is a coffin-like sandstone reliquary containing sacred offerings excavated from an Olmec tomb dated to the early first millennium B.C. The engraving on its longer sides portrays the feet of a quadruped (jaguar? cayman?), but equally prominent is a series of bifid tongues that fill the uppermost register. Beatriz de la Fuente, who describes the pattern on the shorter side, is fully aware of the "two elements, probably fangs whose ends are bifurcated and turn outwards. From the mouth emerges a bifid tongue [passing] over and beyond the lower lip." De la Fuente's reluctance to acknowledge more forthrightly the serpent so emblematized is underscored by her reference to this design as "human-feline," despite the hazy evidence of the latter.[149] Latent in the pattern of bifurcate fangs and bifid tongue, however, is a feature that is precisely relevant for my second, more salient case—for this pattern is but one of a multitude of variations on an elemental emblem that is depicted almost constantly in works of religious art of the period, the Zapotec Glyph C. I will elaborate on this specialized topic in a separate work refuting certain views on feline and toad motifs in Olmec art.

"Glyph C," writes Howard Leigh, describing its ramifications in detail, "is an extremely complicated affair, and to understand it in isolation would be quite impossible. . . . The most impressive part of studying glyph C during two millennia is the sense of continuity one receives. There is always a sense of reaching back and bringing forward an element that has gone out of use, often centuries before. . . . At the time Caso named it, the glyph was believed to represent a stylized jaguar. In the present study, however, nothing has been found to indicate that the jaguar was involved in any way."[150] Glyph C is found inscribed on the earliest relics of Monte Albán I (ca. 650 B.C.) of the Zapotecs of Oaxaca, a phase that is coeval with the La Venta period of the Gulf Coast Olmecs. However, as John Paddock points out, "the style destined to *become* that of Monte Albán I must have been developing during the years 1500–1000 B.C. in various places, none of them much larger than what might properly be called a preurban agricultural village." Glyph C was most intensively developed in its artistic variations in Oaxaca, but it is also known elsewhere, at Veracruz on the Gulf Coast and at Xochicalco. And though it is uncertain which culture came first or exerted a dominant role in culture diffusion, certain strong resemblances have been noted between the La Venta (Olmec) and the Monte Albán I (Zapotec) cultures.[151] "The earliest and simplest form of glyph C," writes Leigh, "is that of

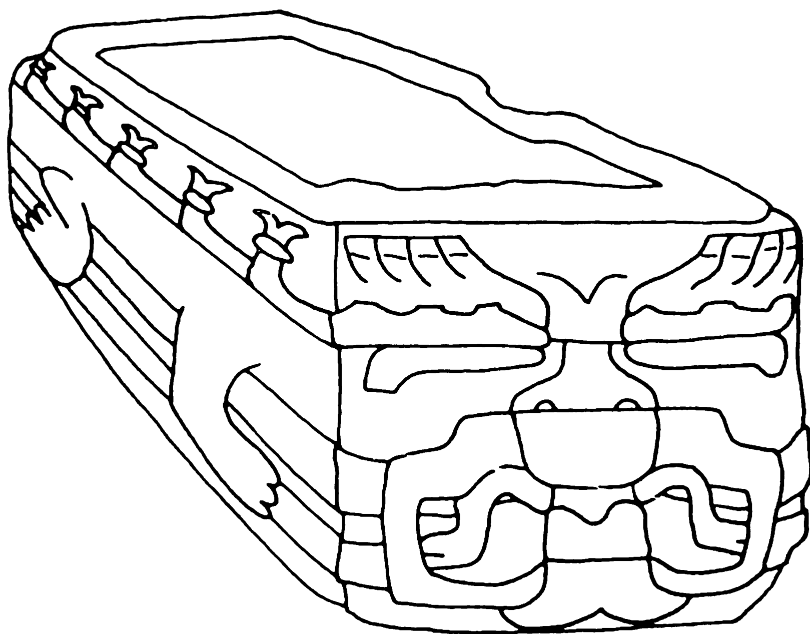


Fig. 67. Monument 6, basalt, Olmec period, pre-600 B.C., La Venta, Tabasco, Mexico.

a vase seen in cross-section and having a horizontal band. This band is often decorated with undulations [or zigzags] that represent water. . . . [some variations involving] bars and dots doubtless represent the calendrical day sign Water. But there is more to it than this. The vase was an important element in the complicated symbolism found on the stones and pottery of Monte Albán I and later periods" (fig. 68).

One of the most significant forms given to Glyph C is that of a right-angled U with curling ends, and myriad artistic elaborations based on this, including shortened limbs for an inverted U. The ends of ancillary elements attached to the U are often bifurcated. What is noteworthy is that it is not until Monte Albán III (A.D. 100–600) that teeth (or fangs) appear on the underside of the U, which is often made to resemble the upper lip, whereas ophidian symbolism is suggested in the earliest period (Monte Albán I, ca. 1000 B.C.) by the zigzags or undulations, believed to represent water, on the horizontal band across the U. Now, throughout Mesoamerica, it was the serpent—far more than the jaguar—that was linked with water, moisture, rain, and the deities presiding over them. Leigh describes an engraving on the abdomen of a *danzante* figure (Monte Albán I) as "the head of a god from whose mouth flows a stream [resembling a flattened U] that turns upward. From the circle, the mouth of the vase, ... flows another stream, which joins the first and turns downward, the two forming the serpent's forked tongue" (fig. 68*d*).[152]

The constant reference to the rattlesnake, or its mouth or body parts, in the architecture, art, and calendrical symbolism of Mesoamerican peoples demonstrates their keen observation of reptilian morphology, even of differences between species. The angular form and geometrical arrangements of the proboscidal scales of *Crotalus durissus (tzabcán)* are imitated in certain corbelled



Fig. 68. The Zapotec Glyph C and its artistic applications: *a–h,* all from Monte Albán, represent the vaselike glyph, identified as a symbol of water, and variations of the associated bracket-like element; *d* is believed to represent the god of wind and rain, the circle under his head symbolizing the mouth of a vase while the streams of water flowing around it simultaneously represent a serpent's forked tongue; *j* and *k* are carvings on boulders from Izapa, Chiapas, Mexico; *l* reveals front and side views of a boulder from Tonalá, Chiapas, shaped and ornamented like a serpent's head; *m* is a large square pot from Monte Albán II, ca. 300 B.C., with a glyph indicating water, inverted U-shaped lid handle with curved ends (compare with *d,* or others), and U-shaped motifs engraved on it and on the body of the pot.

arches in the buildings at Uxmal, while those of *C. basiliscus* are imitated at Labna. Four distinct genera are represented iconically in the Pyramid of Tenayuca. The single triangular scale atop the proboscidal scale and the four "perfect" and two "imperfect" rhomboid scales around it, seven in all (seen in most species of *Crotalus*), are the basis of the hieroglyphic sign called *olin nahui*, which has solar and calendrical associations. Many other examples that betray a long history of knowledge and utilization of rattlesnake morphology are available in pre-Columbian Mesoamerica.[153]

It would hardly be surprising, then, if a glyph (typically but not exclusively Zapotec, and relevant to Olmec art) were to have been modelled upon the supraocular scale of the rattlesnake, as has been proposed by Adela Ramón Llige, though she does not specify the glyph involved. She suggests, I think correctly, that the artistically exaggerated "eyebrows" of rattlesnakes sculptured on stelae at many sites in Mesoamerica are based on an authentic trait.[154] The "eyebrow" or supraocular scale described in chapter 1 is characteristic of all rattlesnakes and an emphatic feature of one of the very early relics of the Olmecs, a bone carved in the form of a rattlesnake's head (fig. 72*a*; also see fig. 23). The scale varies in form in different species, but *C. basiliscus oaxacus*, with its rather jutting eyes and thin, flattened supraocular scale profile, is, in my opinion, a not unlikely source of inspiration of the artistic components of Glyph C. And because water and the four quarters of space figure strongly in Mesoamerican myths focusing on serpents, a pottery urn (Monte Albán II, ca. 300 B.C.) that depicts their symbolism is of special import (fig. 68*i*). Its lid has a U-shaped "handle," which may represent a bifid tongue or the "eyebrow." Engraved on it are three small "eyebrows." Four more are engraved on the urn, one at each corner of a square within which are four undulating horizontal lines thought to be a glyph signifying water. The analogy of the lines within the horizontal band of the "vase" forming Glyph C is obvious. Likewise, the flexible placement of fangs, teeth, and bifid motifs beneath the inverted-U element of this glyph make it very suitable for stylized renditions of the upper lip (fig. 68*f,g,h*).

In the light of a recent analysis of the interrelationships of Mesoamerican iconographic elements, one may now revert to Bernal's statement vis-à-vis Covarrubias, Caso, and the jaguar—that "the serpent element, very weak in the beginning, later prevails." According to H. B. Nicholson,[155]

> There are many obvious iconographic continuities, involving both individual motifs as well as clusters, between Olmec or at least Early Classic Teotihuacan and the early sixteenth century. . . . Tlaloc is only the best-known member of an extensive family of intimately interrelated Mesoamerican rain-fertility deities and "dragons" that were especially characterized by prominently projecting "upper lips" and/or snouts, the prototypes of which can be traced back to Izapan and Olmec. This intricate complex, which deserves more thorough analysis than it has yet received, appears to constitute one of the best cases for overall Mesoamerican iconographic and probably conceptual continuity. . . . Covarrubias . . . in a famous chart, was the first to publish a "family tree" for the major Mesoamerican deities although he stressed the *en face* mouth configuration, commencing with the Olmec "baby/were-jaguar face," more than the projecting upper lip-snout feature as the key element linking together various earlier and later forms.

The U-form of Glyph C appears to me to have been the most convenient

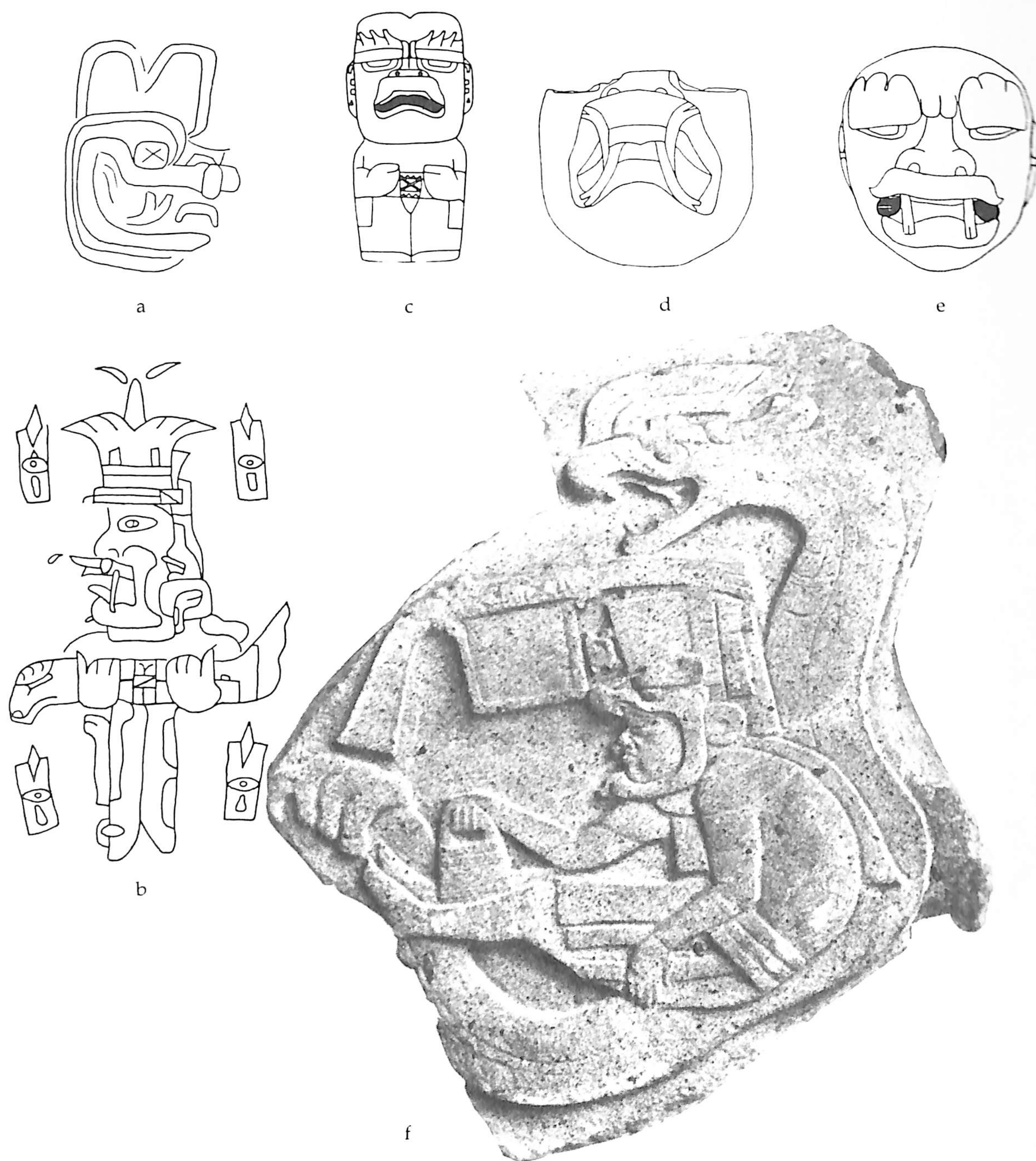


Fig. 69. Olmec sculptures showing bifid tongue or tongue-like fangs in *a*, *d*, and *e* and the emphatic depiction of the bracket-like upper lip in all cases. The personage in *b* holds an ophidian (?) insignia with a distinct bifid process decorating its midsection; *f* is Monument 19, Middle Preclassic Olmec, 1000–600 B.C. LaVenta, Tabasco, Mexico, a gray basalt relief of a gigantic rattlesnake (with plumed head?) and a priest or ruler, who may be its alter ego. Naturalistic jaguars, toads (or other species) conveying religious overtones of comparable power are unknown in Olmec art.

abstract symbol available for the portrayal of the lip (as the thick, stylized, even later, distorted, variants) or mouth of so many deities in the Mesoamerican patheons. The antiquity of the glyph, the strong likelihood of its diffusion among the several cultures of the Late Formative (or preurban) periods of Mesoamerican civilization, and most particularly its numinous, ophidian aura, which must have been rooted in far earlier times all seem to account for its popular iconographic application. Among the most notable relics of the very early Olmecs before their migration to the Gulf Coast, and perhaps relevant in view of their possible relationship with Chavín, are the stelae at Izapa and Pipijiapan near the Pacific coast in Chiapas (fig. 68*j*,*k*). Far from being a weak metaphor, the earliest known images of humanoid deities, especially those linked to water and agricultural fertility, show their chthonic affinities beyond question. They range from the Olmec god I, with his thick, inverted-U upper lip, bifid tongue or bifid fangs (fig. 69 *b*, *c*, *d*, *e*), and the Zapotec Cocijo (fig. 52*b*,*c*) to the considerably later Huastec-Yucatec Mayan Chaacs, with their labial excrescences that look like elephantine trunks, the Totonac Tajín, and the Quiche Tohil; and all these deities were associated with rain. The most emphatic restatements of the ophidian sentiments originally tied to Glyph C and the U-shaped lip are found in several images of the Aztec rain deity Tlaloc. In one of the most pregnant of these, his face consists of a pair of elaborately coiled serpents whose heads meet lip to lip—as *Tlaloc's* lip (fig. 70*a*).

Is the acclamation of the jaguar as the supreme cult animal of one of the earliest known settled peoples of Mesoamerica warranted by our present, inadequate knowledge of Olmec religon? Did the Olmecs, in fact, signify the jaguar in their thick upper-lipped, "baby-face/werejaguar" images, or has the notion of a"jaguar mouth" been groundlessly fostered because of a failure to question an initially subjective opinion based on stylized art motifs? Joralemon's extensive iconographic analysis justly draws attention not to the jaguar as such, but to mythological, often bizare, portrayals of the Olmec "dragon"—a composite creature in which reptilian (chiefly serpent), feline, and avian characteristics blend. Among these, the recurrent presence of the infallibly identifiable bifid tongue, plus the symbolic associations of Glyph C and its U element, constitute the strongest indication that the precursors of artistically hybrid creatures were primarily ophidian. Traits of species other than the serpent are either hazy or conjectural in these chimeras.

Now, it is true that little is known about Olmec religion, but can the much better-known cultures of later periods provide an insight into the preurban, formative phases of Mesoamerican civilization as a whole? In most of the Western Hemisphere (in contrast to western and southern Asia), societies evolved until the sixteenth century practically free from catastrophic upheavals in local religious, agricultural, and technological tradition. Such culture diffusion as did undoubtedly occur involved no interactions of radically different racial stocks and cultures. I agree with Joralemon and Nicholson, both of whom, in essence, imply a continuity of basic religious custom and iconography whose roots, surely, go back farther in time than it is feasible to retrace through archaeological relics alone. The question that remains, therefore, transcends archaeological criteria: Which of the two—jaguar or serpent—impelled cultic attention more strongly and, perhaps, earlier? The answer cannot be separated from the wider biological and other considerations contained in the rest of this book. We may,



Fig. 70. The rain god in Mesoamerica: *a*, effigy in stone of Tlaloc, his visage composed of a pair of coiled rattlesnakes whose heads meet in such a fashion as to define the god's upper lip; *b*, the earliest known effigy of Tlaloc, in the form of a pottery vessel, Teotihuacan I, 200?–100 B.C.; *c*, hypothetical, questionable chart suggesting "Olmec influence on the evolution of the jaguar mask into rain gods" according to Miguel Covarrubias.

however, employ ethnographic analogy at least to retrace our steps back from early conquest times, recalling that as "fearsome" animals with myth-provoking potentials jaguar, ocelot, puma, and lynx (for ecological reasons) must surely have intruded far less upon normal human activities than the reptiles of the Mesoamerican fauna.

Felines and reptiles were at times envisioned conjointly. The early sixteenth-century chronicler Gregorio García observed that the Mixtecs had a god and goddess who bore the epithets *culebra de león* ("serpent of the puma") and *culebra de tigre* ("serpent of the jaguar"), respectively, from which one may deduce that honor redounds primarily to the reptile.[156] Instances of ophiolatry are not hard to come by in the old chronicles, but it is difficult to identify anywhere in Mesoamerica a culture that worshipped, sensu stricto, a feline. Pedro Castañeda de Nacera's report on the veneration of snakes by the Tahue, at Culiacan in western Mexico, has already been cited.[157] Juan Ratkay indicated that the Tarahumara had a large idol in serpent form, "about two ells in length" which served as an oracle, but there is no mention of felines.[158] In Aztec mythology and symbolic art felines figure very frequently, but as deities neither the jaguar (in Nahuatl, *ocelotl*) nor another spotted feline, the ocelot *(tlalocelotl)*, seems to have been invoked any more markedly than the butterfly and the coyote. Tlaloc, the outstanding storm and rain god of the Aztec and precursor pantheons, was on occasion known as *ocelocóatl*, "jaguar-serpent," but his purely ophidian origins are quite well established.[159] Another deity, Tepeyollotl, may merit the term feline, since, in his role as "Heart of the Mountain," he is represented in the Codex Borbonicus and elsewhere as an anthropomorph clothed in a jaguar skin. However, ophidian overtones often persist in his ornamentation, notably in the abstract design of his emblem, in which Glyph C, including its horizontal band, is dominant. The design is devoid of any feline motifs, but a bifid tongue and U element emerge from a vase while the cardinal points are represented by four mollusc shells around concentric circles (fig. 73*a*). Moreover, Tepeyollotl is merely an aspect of the god Tezcatlipoca, who does not in any way merit the epithet "feline." Hvidtfeldt's Nahuatl index and translations of ritual texts of central importance in Aztec religion contain references even to the butterfly goddess Itzpapalotl, but none to *ocelocoatl* and Tepeyollotl. By contrast, ophidian deities are invoked in Aztec prayers with impressive frequency.[160]

Ruiz de Alarcón's treatise on Aztec ritual and prayers includes, as I have pointed out in chapter 2, supplications to venomous vipers and loathsome serpents but none to felids. The more influential of the spirits of the Mexica were ophidian beyond doubt, as the affix to their name, *coatl* ("serpent") alone shows: Cihuacoatl (fig. 71), Chicomecoatl, Coatlicue, Mixcoatl, Ezcoatl, Tlapalcoatl, Xiuhcoatl, and Quetzalcoatl—not to mention others such as Tlaloc, whose most characteristic attribute is ophidian, Tlazolteotl, with her ophidian vestments, Cinteotl, the goddess who personifies the staple maize plant itself, with her characteristic serpent belt, the solar god Tonatiuh, whose face (especially in calendrical art) is almost invariably bordered by four, or eight, bifid-tongue symbols, and the important god Huitzilopochtli, who is armed with a serpent[161] befitting his mother, Coatlicue. In some Totonac villages today, grottoes house idols of Kitsis-luwa ("five-serpent"; also Skanis-luwa, "serpent of water"), protector god of the maizefield; effigies of serpents are used in dances, and many are the myths that surround them. A cult animal so deeply venerated despite the inroads of Christianity is hardly likely to have emerged from the



a b

Fig. 71. Cihuacoatl, goddess of childbirth, "mother of the human race": *a*, effigy in stone, Aztec period, ca. fourteenth century A.D., Valley of Mexico; *b*, large effigy in clay of the goddess wearing a belt of serpents and a headdress representing an infant with bifid tongue symbols on forehead and beheath the jaw, sixth–ninth century A.D., El Cocuite, Veracruz, Mexico.

obscurity of an incubation period, much less supplanted a feline cult, had the latter been at all deeply entrenched in the ancestral cultures of Mesoamerica.[162]

The pantheon of the Chichimecs of the plateau region of Mexico, described at length by E. J. Palacios with frequent stress on ophidian deities, was for all practical purposes indistinguishable from that of the Aztecs.[163] The principal Chichimec deities were Tota and Tona. Tota, a solar god, assumed, according to Palacios, the guise of the cloud- (i.e., moisture) serpent Mixcoatl; Tona, an earth and agricultural fertility goddess, took the form of the seven-serpent-headed Chicomecoatl, a variant of the Coatlicue and Tonantzin of later, Aztec times.

The transport of the cult of Quetzalcoatl to Yucatan by the Toltecs (after the fall of their capital Tollan on the Mexican plateau, ca. A.D. 980) entailed no

imposition of a radically strange custom rooted in serpent veneration upon the Maya, whom they subjugated when they moved their capital to Chichén Itzá. Yucatec Maya of this Postclassic period worshipped Quetzalcoatl under the name of Kukulcan ("feathered serpent"), thereby merely adapting themselves to a form of ophidian cult different from their own, for evidences of serpent veneration abound in Maya culture from the Classic period down to the sixteenth century and even later. Contact-period documents reveal that the functional equivalents of Chicomecoatl were the Mayan Yum Kaax and Ix Kanleox and that the principal Maya deities were patterned after the rain-giving Chaac of much earlier times, the supreme Mayan deity being addressed as Itzam Na. This "greatest of their gods" is known everywhere in the Maya region in Mexico, Honduras, and Guatemala in sculptures of the Classic period and gave rise, in Yucatan at least, to a cult which, much before the Toltec intrusion, "appears to have approached monotheism."[164] Now, *itzam*, in the literal sense, signifies, according to J. E. S. Thompson, a reptile, the iguana; but inasmuch as artistic renditions of this lizard endow it with the patently ophidian feature of bifid tongue, indeed depict it (as in figure 16) in the form of realistic serpents and dragon-like monsters, the word *itzam* accords well with the metaphor "serpent," explained in chapter 1. Itzam Na (literally "house of iguana") had celestial and calendrical connotations besides representing the Maya conception of the visible universe as a cube bordered at the four corners by the bodies of four *itzam*. This stereotype is clearest in the beliefs of the present-day Tzotzil and Chorti Maya. The latter use the word *chicchan* (*chan* or *can*, literally "serpent") for their important group of four half-human, half-serpent deities, or fully ophidian forms, that represent the four corners of the sky or world directions and their respective colors. These are the monsters that send rain and thunder, which are but the products of their angry shouting at each other.

The bifid tongue and rattlesnake tail motifs recur almost constantly in the elaborately stylized art of the Maya even amid obvious feline features or are blended with those of other animals, including, on occasion, the bird. Ophidian motifs are rarely absent in the major, plainly sacred as well as secular themes in Mayan religious buildings. The subtle and diverse ways in which one element or another of ophidian morphology was utilized in architecture, sculpture, or painted ceramics, where feline motifs are not in evidence, is lucidly illustrated in the first eighty diagrams that precede José Díaz Bolio's extensive treatment of Mayan preoccupation with the serpent motif. Thus, the question arises: What did the jaguar signify?

The jaguar's association with royalty is exemplified clearly at Palenque by the ruler Pacal's inscriptions. These link his reign with that of a mythical forebear who, according to these inscriptions, existed one and a quarter million years earlier. Pacal's and his heir's glyphs constantly take the form of an animal head that combines the characteristics of a serpent and a jaguar and, for this reason, is termed Chan-Bahlum, the conjoint Chol word for the two animals.[165] At the Classic Maya site of Uaxactun, the temple stairway is flanked at the lowest level by sculptures in the round of enormous serpent heads, behind which, at the next, upper, level, are equally large high reliefs of *humanoid* faces termed "sun-jaguar" masks by some,[166] though their feline features (or symbols) seem rather obscure. Clearly, it is at times difficult to separate the secular, merely heraldic, from the divine aspects of any animal which is equally suitable

as *nahual* or malefic spirit, as a powerful symbol of royal might, or as a totem. One may, therefore, usefully recall Thompson's view that "much art of the Classic Maya period can be interpreted as recording assertions by chief rulers [usually also religious leaders] . . . based either on descent from deified ancestors, or less probably, on divinely influenced election. This is most manifest in the way the chief rulers bedecked themselves with the insignia and trappings of Itzam Na, the greatest of their gods."[167]

For further clues as to the status of the jaguar versus the serpent in a context of constant ethnic interactions, cultural diffusion, and continuity of traditions in Mesoamerica, we may consider the murals at the important ceremonial and commercial center at Cacaxtla, Tlaxcala. Dated to the Late Classic period (A.D. 700–800), these murals are significant in exhibiting certain artistic elements found at distant, older religious sites such as Teotihuacan, Xochicalco, and Cholula—in which connection we must remember that it is the serpent, not the jaguar, that is the common element in two of the most significant chimerical combination (man-serpent-jaguar and man-serpent-bird) in the iconography of Teotihuacan. Moreover, Cacaxtla embraces a region associated with the movements of the Olmec Xicalancas, a historical ethnic group with Olmec affinities. In the principal chamber of Building A at Cacaxtla, the mural on the south side is reminiscent of Teotihuacan in showing priests (attired in jaguar skins) in *obeisance to Tlaloc.* On the north wall, from a bundle of spears held by a similarly attired personage, drops of water are depicted falling on the head of "a serpent with feline attributes," while, close by, Tlaloc pours water from a vase. Hybrid man-jaguar-serpent and bird-serpent figures occur, as do references to the key number thirteen of the Mesoamerican religious calendar, the glyph P (of a human head, also known at Monte Albán), and the numerals "nine eye of the reptile" and "seven eye of the reptile." Priest-warriors are portrayed as partly eagle or partly feline humans. There is no clear evidence of deification of the jaguar, but the focus of attention in these mythico-religious murals falls preponderantly on water and Tlaloc and secondarily on Quetzalcoatl.[168] In this respect, do the Cacaxtla murals show any affinity with relics from Olmec and Oaxacan sites?

There are, according to George Kubler, fewer Oaxacan and Olmec representations of felines, and they display less variety, than at Teotihuacan, where "the jaguar always mingles with other life forms, chiefly bird eye [a moot identification] and serpent tongues, to appear as a cult figure with its attendants or worshippers. These wear the insignia of a ritual we may designate as jaguar-serpent-bird."[169] At Teotihuacan, water and the cult of the rain god are constantly symbolized. In the Early Classic period (pre–600 B.C.) of this important agricultural settlement, the rain-god complex includes hybridized reptile, jaguar, starfish, flower, and warrior aspects, but images of the jaguar alone are not prominent. Furthermore, the earliest known effigy of Tlaloc (fig. 70*b*) has no fangs distinguishable as "canine," "feline," or "ophidian," but there are prominent, cylindrical moldings around its bulging eyes, and a similar, U-element-like molding defines the lip as if to presage the effigies of later (including post-Teotihuacan) times when Tlaloc's serpent symbolism is explicit. For chronological reasons surrounding the discovery of this effigy, Hasso von Winning correctly regards Covarrubias's hypothetical chart of "the Olmec influence on evolution of the jaguar mask into rain gods" as "no longer acceptable."[170]

In view of all this—the aqueous and ophidian connotations of Glyph C and of the U element almost always associated with it, the widespread occurrence of this artistic element in Early Classic times (not only at Monte Albán, where it is exuberant, but also at La Venta, where it was possibly a real hieroglyph of the Olmecs[171]), and the versatile use of the U-like "eyebrow" scale of rattlesnakes in art—the religion of Monte Albán may have had a special importance that prompted the other regions of Mesoamerica to employ one of its most sacred glyphs as a religious emblem. In each of the two early examples (figs. 52*c* and *d*) of the Zapotec rain god Cocijo, the tongue explicitly identifies the animal that serves as his emblem. The stylized upper lip of the idol in figure 52*d*, however, could delude one into the belief that Cocijo is also partly feline—particularly if one proceeds on the questionable premise that such a lip marks it as feline by analogy with the Olmec "baby-face/were-jaguar" concept.

One is on firmer ground if one equates bracked-shaped lips like Cocijo's with an inverted U element and regards its associations with Glyph C and water as prima facie indications that such lips (and the "jaguar" or "Olmec" mouth formed by them and their variants) ultimately are emblematic references to the serpent. At Monte Albán, exaggeratedly thick upper lips, i.e., inverted-U elements, are characteristic of a variety of fully or partly anthropomorphic ceramic images, including the bat god, bird effigies (some with bifid tongues), the jaguar, and personages carved on stelae.[172] Manifestations like these are scarcely different from those in the Olmec images already given as examples. The exaggerated upper lip varies in form from realistic works of art like the monstrous rattlesnake carved on the Olmec Monument 19 at La Venta to abstract U-element and bifid-tongue motifs encountered in the style known as Izapan, a style that displays both Olmec and Maya affinities.[173] At one of the earliest sites yielding Olmec-style objects, Xochipala, in Guerrero, jaguar effigies are not known, and the few animal effigies excavated so far include a bone carved in the form of a serpent's head found with a vessel painted with a frog design and some small, thick ceramic brackets (with crozier ends recalling the "eyebrows" of that serpent-head effigy). The depressions atop them suggest that these vessels were meant for ritual unguents (fig. 72*b*). At Chalcatzingo, dated to about 900–800 B.C., U-elements and bifid tongues are painted or carved as isolated motifs on rocky outcrops and even the heads of rampant jaguars, ferociously attacking humans felled by them, are represented with bifid crests.[174] In general, in Mesoamerican portrayals of hybrid animals, including man, it is the serpent which in some form or another is ornamentally superimposed upon, or blended with, the body of another species. This symbolism is often remarkably subtle in sacred art.[175]

To sum up: The basic unity of the diverse cultures of Mesoamerican civilization—evident in their religious calendars and their essentially similar social and artistic traditions—facilitates my conclusion that it is hard to pinpoint an image that can be stereotyped as that of a *primarily* feline deity, i.e., identifiable as such in the early archaeological record through homology with iconographic or functional attributes of an established, named feline deity of later times. From the earliest, Monte Albán/Olmec times to the Aztec period, the chief deities of water, the sun, the four quarters of space, and agricultural fertility seem to have been serpents or at least were assigned an ophidian attribute. The hallmark, besides bifid tongue, supraocular scale, and rattles, was often the exaggerated

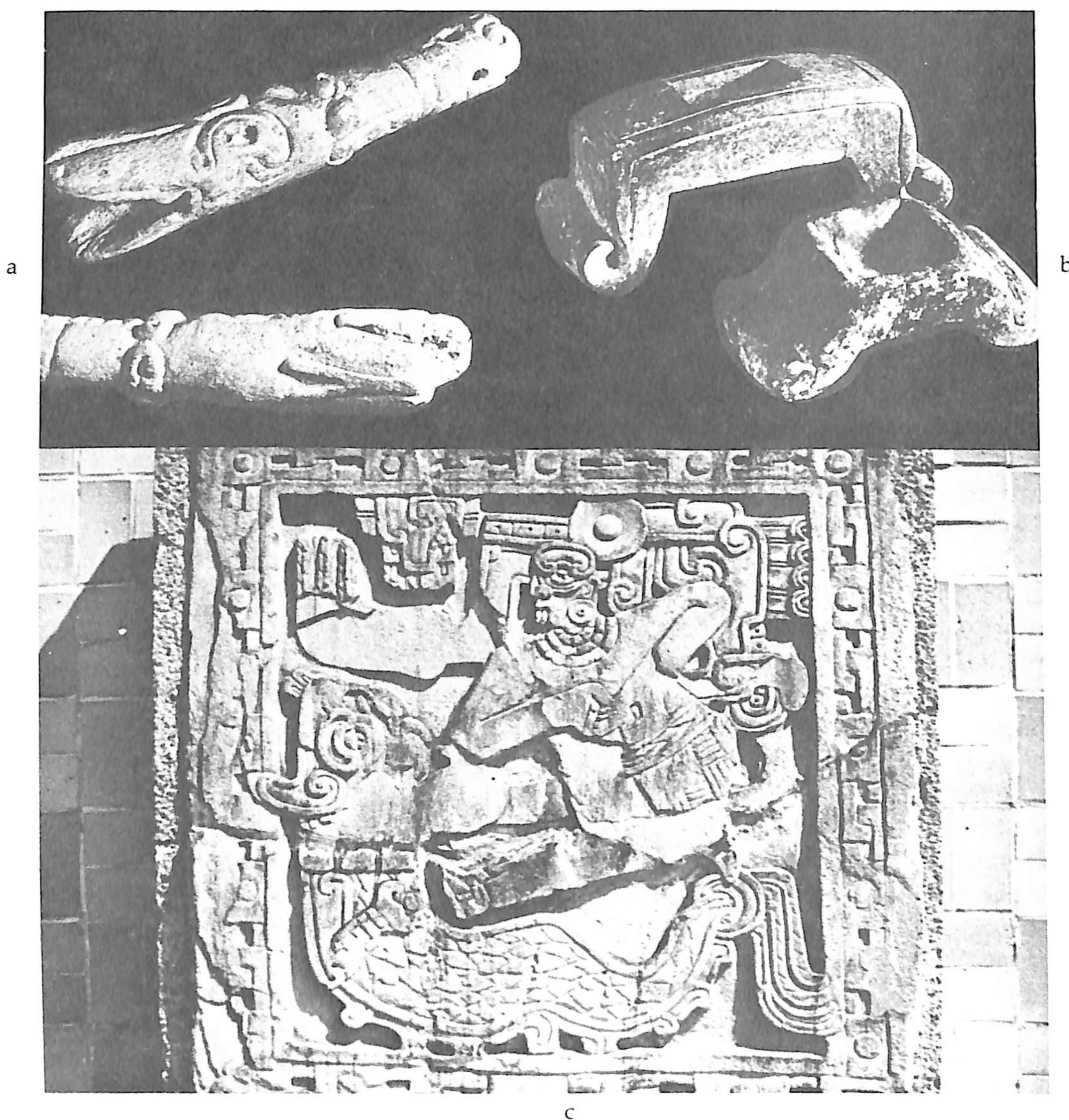


Fig. 72. The rattlesnake's "eyebrow" scale in Mesoamerican religious art: *a*, bone carving representing a rattlesnake's head, showing shape and prominence of the "eyebrow" (cf. figs. 23, 24), and *b*, miniature ceramic vessels, possibly for unguents, both from an Early Formative, West Mexican culture, early first millennium B.C., at Xochipala, Guerrero, Mexico; *c*, the rain god Tajín descending from the sky on his serpent-cloud mount, both with prominent eyebrows (cf. fig. 25), Late Classic Veracruz, seventh–ninth century A.D., El Tajín, Veracruz, Mexico.

(or in other ways stylized) upper lip, a glyphic symbol of very ancient origin connecting reptiles with natural phenomena. Iconographically, this symbol also appears as an appendage of several other zoomorphs besides the jaguar. To the extent that the bifid tongue, supraocular scale, rattles, and their original glyphic associations are the common factor in depictions of hybrid animals, the serpent appears to have entered religious thought more forcefully, if often cryptically,

than any other animal, including the jaguar. The psychological roots of impulses for so marked an artistic utilization of ophidian symbols in Mesoamerica surely lie deeper than the earliest archaeological relic can disclose. However, the epitome of a few of the illustrations intentionally deferred until now is a massive stone sculpture that once was part of the great Pyramid of the Sun at Teotihuacan (fig. 73*f*). Consisting of conventionalized, U-shaped tail rattles joined directly to a bifid tongue, it represents—with a power missing in any felid-inspired symbol known to me—the quintessential rattlesnake.[176]

CANIDAE

Wolves, foxes, and wild dogs are distributed worldwide.[177] Except in physical characteristics, they are very much alike, and it is unimportant for our purposes to categorize each group rigidly. They are all gregarious and communicate with each other vocally with emotion-conveying cries that range from barks and howls to whimpers and snarls. Individuals exhibit their own affinities and parental responsibilities within highly developed social hierarchies. All are intelligent and quick to learn from experience; all generally avoid man and are quite harmless. Reports of ferocious attacks by hyenas and hungry packs of wolves are exaggerations, though they may have occurred occasionally. The wolf's wicked reputation rests better on its depredations on livestock and therefore seem to be related to the emergence of farming in Neolithic times. The extinct Antarctic wolf (or "dog") *Dusicyon australis* was tame enough that Falkland Island settlers, who desired its fur, killed it by offering a piece of meat with one hand and thrusting a knife with the other. Early human social evolution may well have benefited from man's keen awareness and exploitation of canine social behavior. The domestication of the dog was in good measure facilitated by the transference to man of the normal canine tendency to accept the authority of a dominant member of its own species's social hierarchy—an instinctive submission perhaps strengthened by the commensalism of the hunt.[178] Canids are indeed *bons à penser*, as secular metaphors attest worldwide.

Yet canine deities are conspicuously few. I am aware of no case of veneration of canids by South American aborigines, despite the fact that canine species are particularly varied in that continent. I am also inclined to believe that elsewhere in the Americas societies which do in some way sanctify a canid but do not regard the serpent as equal if not greater in importance must be exceptional. The Aztecs and their forerunners had a coyote god of lust and merriment, Huehuecoyotl, not to be confused with one of the most important of pre-Teotihuacan deities, Huehueteotl, god of fire and the sun and the precursor of Xiuhtecuhtli, whose emblem is the solar- or fire-serpent Xiuhcoatl. Ironically, in the sacred calendar the coyote is linked with the fourth day, Cuetzpallin (named after a reptile, the lizard), rather than with the tenth, Itzcuintli (named after the dog), whereas in the Maya and Aztec calendars the fifth day was named Chicchan ("rain-serpents") and Coatl ("serpent"), respectively, and directly associated with the rattlesnake and the rain god Tlaloc's wife Chalchiuhtlicue—who, appropriately, presided as goddess of the waters. In cosmological beliefs the dog is hardly more important than the serpent: Venus was symbolized both by the canine Xólotl and, predominantly, by the latter demigod's twin brother, the ophidian Quetzalcoatl. A myth recounts how, at the commencement of a



Fig. 73. The bifid tongue and bracket-form lip in Mesoamerican animal representations: *a*, the emblem of Tepeyollotl, the jaguar-skin garbed aspect of the non-feline god Tezcatlipoca; *b*, sculpture of jaguar in the monolithic Aztec temple, Malinalco; *c*, pottery head of jaguar, Monte Albán; *d*, pottery vase with the mask of a broad-billed bird, Protoclassic, early Monte Albán II (150–1B.C.); *e*, two views of a stele from Los Horcones, Chiapas, Mexico, with engravings of a bird and a jaguar with long, protuberant bifid tongues reminiscent of the style of Teotihuacan; *f*, massive, monumental stone from the Pyramid of the Sun, Teotihuacan, symbolizing the rattlesnake through bracket-like forms (representing its rattles) joined directly to the image of its tongue. Compare the conventionalized U-shape and axial orientation of the rattle segments here and in fig. 69*f* with the actual characteristics in rattlesnakes, shown in fig. 23*f*.

new cycle of time, Quetzalcoatl assumed Xólotl form before descending into the Underworld for bones of the dead in order to recreate man. In the large group of stars known to the Mexica as the "dog" (our Taurus), the most conspicuous cluster, the Pleiades, was imagined to be a dog's eye and most of the remainder the tail of Quetzalcoatl or Xiuhcoatl. This and similar astral myths were important enough in Mesoamerican religion that they are traceable to



f

much older cultures than the Mexica. A vase from Teotihuacan, for example, depicts a creature with canine (coyote's ?) forelegs and head with bifid tongue grafted upon a long, curved (featherless) serpent's body bearing a design of stars (fig. 74*a*). To the Maya the Pleiades were exclusively ophidian, as is evident from the word *tzab,* which in Yucatec dialects simultaneously denotes this constellation and the rattlesnake's rattles.[179]

The coyote and the wolf were venerated by several North American aboriginal tribes without downgrading the generally widespread ophidian traditions inherited by these tribes. Thus, the Nootkan wolf dance or *klukwalle,* an initiation ritual common to all Northwest Coast Indians, despite its great importance, is believed to have originated no more than about 280 years ago. In the wolf-

dance of the Quillayute, neighbors of the Nootka, the shaman dances with a rattle-wand decorated not with a wolf motif, but with that of a double-headed sea serpent. The wand is grasped symbolically by both ends.[180]

The hyena is a cult animal in several African societies, but there are other cult animals of equal if not greater importance to its worshippers. The Sidamo of Ethiopia regard both serpents and hyenas as intermediaries between their high god and the tribe's ritualists. To the Turu of Tanzania, the hyena is one of the immanent aspects of divine power, and so is the lion, which is one of this power's most terrifying forms—but the Turu also keep and worship the python.[181] Among the Gã tribes of Ghana, a hyena god called Klan is "worshipped by a limited group annually on his own day," but apart from taking oaths in his name the villagers "are conscious of no other relationship to it."[182] The principal Gã tribal gods are ophidian, four of whom—Awudu, Aya, Osabu, and Owufu—occur constantly in their beliefs.

The Luo of western Kenya avoid the literal word *thuol,* but call the serpent *tond-bungu,* "rope of the forest," according to Hauge, who mentions only one other animal—the hyena, which they venerate but whose literal name is also tabooed. This is because it is considered to be "crafty," not because it is physically feared.[183] The Dogon of Upper Volta and Mali have (in Mali) a temple dedicated to the hyena. The murals around its main entrance, however, depict the stars, moon, and sun, amidst which a long, winding serpent is painted all around the portal. Dogon myths are not especially rich in hyena lore, but those concerning creation and sacred ancestors are importantly related to serpents—one of their most remarkable relics (at Gogoli) being a wooden, stylized replica of a serpent 10 meters in length. This and similar smaller images (fig. 7,*l–q*) are customarily placed with their heads resting over beds of bones and skulls of Dogon ancestors.[184]

The Tasmanian "wolf" *(Thylacinus cynocephalus),* a marsupial, doglike canid almost as large as the grey wolf, is a naturally shy, nocturnal creature that normally sucks the blood of smaller kangaroos, wallabies, and other mammals. Whether it attacked sleeping humans to suck blood from the jugular vein (its normal habit) I do not know. Australian Aborigines may have been quite familiar with the species before the shooting of the last wild specimen on record in 1930. In any case, canids (including the wild dingo) figure importantly in western Australian Pitjandjara cosmogonic myths as ferocious demonic beings that bite one's penis and testicles. They are an important part of the Pleiades myth, yet Pitjandjara legends and ceremonies at their ancestral cave site involve the painting of *leiru* or serpent markings on rocks in addition to the canids painted as part of the Pleiades myth. This contains episodes in which tribesmen attack and subdue serpent-beings.[185] A gigantic dog is part of a belief in the *kobong* (or totem) according to which, in the beginning of time, a number of creatures in human form came forth from the earth and helped the tribespeople—until the appearance of this canine menace. They fled from it by assuming the forms of other totemic animals and plants and finally drove it back to its lair, where its evil spirit dwells.[186] The fact remains, though it may have no connection with this myth, that canids are not the most frequently depicted animals in Aboriginal rock art, all of which may be considered sacred, especially when associated with ceremonial sites. Davidson's list of sites with rock carvings, paintings, and

Wondjina galleries throughout Australia may not be the latest, but it is exhaustive. It indexes canids ("dingo") only once, and it is clear that serpents are the most frequently depicted of the different animals that commonly figure as totems.[187]

The Cheremis, Yakut, and perhaps other Finno-Ugric peoples and even the Lapps, who have close cultural connections with them, customarily placed a stout knotted stick in the hands of the deceased before burial. This was to enable him to defend himself against attacks by dogs (wolves?) *and* serpents during his journey through the netherworld.[188] It is of interest, as we shall see in chapter 5, that the dog rivals the serpent in fearsomeness in the imagery of dreams. A crude relief on the façade of the village church in Kosturinci (Trān), Bulgaria, shows a canid grabbing a staff from a man's hand while behind him rears an enormous serpent (fig. 74*b*)—a composition reminiscent of the Cheremis and Yakut mortuary custom and of the demoniacal netherworld scene depicted in a Lappish work of art (fig. 74*c*).

That certain canids have impressed man as fearsome animals is plain from circumlocutory references to the wolf by the Siberian Enets: the use of "the evil spirit," "the long-legged," "the old one," and "the deer-killer" rather than the liberal, tabooed term *sarmik*[189] exemplifies the depth of Eurasian sentiments against it. The pre-Christian Lithuanians, however, offer one of the few important examples of a wolf deity. Known as Velnias or Velinas, he assumed, in his role of god of death, magic, and the underworld, the form of a wolf in order to tear people apart. He was also the creator of both reptiles and blackbirds[190]—which, too, are regarded as evil and destructive in northern European mythology.

The "evil," "crafty," or "ferocious" aspects of canine behavior are sometimes upheld in the traditions of important civilized societies. In Heimpel's compilation of Sumerian and Akkadian cuneiform texts, neither wolf nor hyena, fox, and "howling dog" have divine associations of any kind. Temple hymns involving them are not listed. References to them are as a rule disparaging, and there is a passing mention of the pariah dog as the second in a group of seven demons.[191]

Werewolves occur in ancient Greek folklore, and traces of a belief in them exist even now, especially in Arcadia. That there were lupine members of the Greek pantheon is, however, most doubtful. Zeus, in his form of Lykaios (=wolf), is sometimes regarded as one, but after a detailed examination of the linguistic and mythological background, Arthur B. Cook considers this identification "open to grave objection."[192] On the other hand, Cretan and Greek traditions abound in serpent cults and deities, Zeus himself appearing in clear-cut ophidian forms with different aspects such as Meilikhios, Ktesios, Polieus, and Herkeios.

Canids have no importance as sacred animals in Hinduism. They are not in any sense deified as the serpent and bull are, though, like these animals, they have been employed in iconography. They identify only two deities, one of whom (Bhairav) is merely an aspect of the god Śiva, who, as a naked mendicant, wears a necklace of human skulls and is accompanied by a dog. The stereotype Śiva, however, is a god whose characteristic symbols are the cobra and the bull. The other, Yama, god of death, is guarded by a pair of fierce, four-eyed dogs.[193]

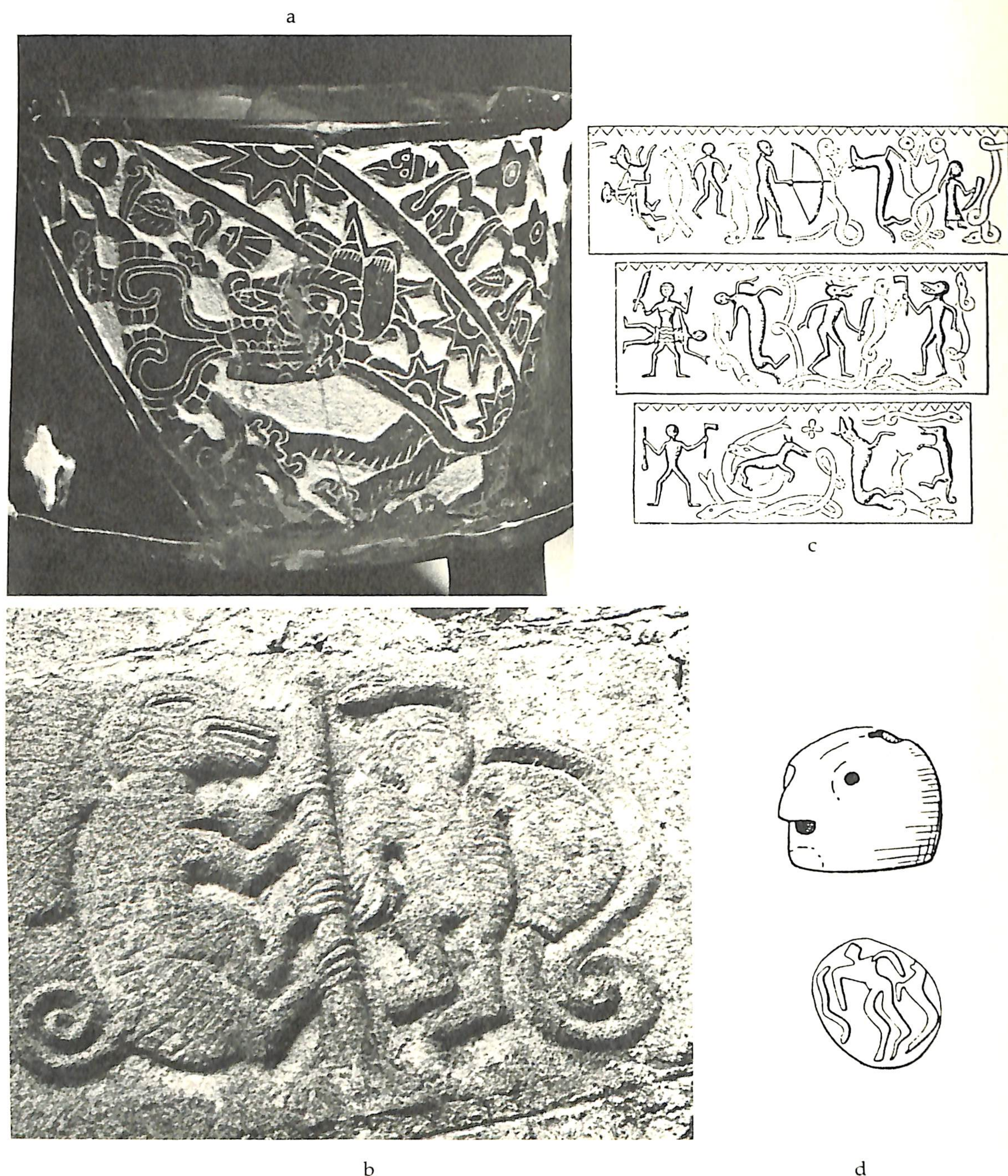


Fig. 74. Canids and serpents in religious art: *a*, painted mortuary vessel, Teotihuacan culture, ca. 100 B.C., Mexico, depicting a mythical creature with canine head and forelimbs but an ophidian tongue and coiled body; stars on the body suggest the myth of Quetzalcoatl and Xólotl, divine twins who symbolized Venus and constellations the Aztecs called *tzitzimime* ("dog") and *ytianquiztle* (the Pleiades); *b*, relief from the façade of a village church, Kosturinci, Trān, Bulgaria, showing man attacked (?) by serpent and dog or wolf; *c*, engravings on metal depicting canids (wolves?), serpents, and demonic beings, probably from a Lappish myth; *d*, ivory stamp seal from the Sphungaras cemetery, Early Neolithic, Crete, shaped like a human head with the design on the base consisting of a person flanked by serpent and canid.

Lest one think that canine ferocity is a facile motivator of symbolic associations, one should consider the symbolism of the Egyptian gods Anubis and Upwawet, who are at times erroneously called the jackal god and wolf god. This baseless distinction stems from the Greek appellations Lykonopolis, "wolf-town," for Assiut (where Upwawet was the local deity name) and Kynopolis, "dog town," for all canine cult locations elsewhere, though the ancient Egyptians themselves called Upwawet the "Upper Egyptian jackal." Actually, they made no distinctions in the artistic representations of Upwawet and the more widespread Anubis, and the terms "jackal" and "wolf" are questionable because the images reveal only a nondescript crossbreed canid with the identifying features of neither species—consistent with the fact that Egyptian fauna lacked true jackals and wolves.[194] Anubis (or Upwawet) was a god of the graveyard and of funerary rituals, especially embalming. He is at times called the god of death, perhaps because of the bituminous black embalming paste that almost always covers his images. His later mythic role in the Osirian cycle shows that it is correct to regard this god as one who presided over rebirth, about which the Egyptians were as much concerned as with the fact of death. Anubis/Upwawet is represented either as fully canine or as an anthropomorph with canine head. His positive, beneficent role is evident from the sacred uraeus cobra that frequently appears adjacent to his images on funerary objects and standards carried in the forefront of processions during festivals, burials, and coronations. Indeed, the name Upwawet literally means "opener of the ways" (fig. 75).

If one seeks a reason for the invocation of a canine deity in these contexts, it will not be found in canine ferocity, for this hybrid "jackal" was better known among Egyptian commoners as a desecrator of graves and as the possessor of a keen sense of smell and a fondness for bones. How better were they to prevent this than by elevating this animal to the rank of "Protector of the Dead" and "Overseer of Graves"—for much the same reason that pre-Christian Lithuanians appointed the god Velnias, a wolf, the protector of sheep?

From our viewpoint however, a more pregnant clue can be found in a single divergent feature in the fully zoomorphic images of Anubis and Upwawet, a feature that reflects ambivalence towards the serpent: Artists often portrayed Anubis (particularly the form known as Chontamenti) couchant and subduing a cobra, and it is no coincidence that the feet of the god Bes are sometimes shaped like the head of "jackals" when he is portrayed trampling upon serpents and other dangerous animals (fig. 35). Upwawet, on the other hand, is cast as an alert, upright animal. The club, bow, and stick are his symbols of belligerency. The erect cobra with spread hood that accompanies his images advertises Upwawet's protective power—the power of venom that was equated with the pharaoh's ability to quell his enemies. Not the least surreptitious of these were *evil* serpents that threatened not only his mythic, nightly journey in the netherworld (actually the pharaoh's sleep), but also, in death, his mummy, as it awaited rebirth in the seclusion of his hypogeum. And real serpents gaining entry into this chamber were the obvious forces with which superstition contended. As I have noted, the pyramids of Unas, Teti, and Seti I contain incantations and spells against venom, but there are no comparable apotropaic inscriptions to ward off the bone-digging canids either at these pyramids or, as far as I know, elsewhere. The Egyptians seem to have had no difficulty in placating them by installing Upwawet/Anubis as guardian.[195]



Fig. 75. The Egyptian "jackal" god Upwawet, "Protector of the Dead" and "Opener of the Ways" (i.e., leader of important ceremonial processions). Bronze on wood pedestal, Middle Kingdom Egypt, flanked by erect cobras, antagonists of evil serpents that threatened the dead in their tombs.

URSIDAE

Bears of various species ranged far and wide over vast territories up to quite recent times, though they were, and still are, essentially Northern Hemispheric animals typical of Europe, Asia, and America. In general, bears are shy and will avoid man, but their rather undeserved reputation as dangerous, fierce creatures is not altogether baseless, as they are apt to be exactly so when their strong territorial and maternal instincts are provoked or when they are hunted. Their omnivorous habits and tractability have brought them in touch with man far oftener than is true of the larger felids, and their skin and meat have always been more easily available. I shall mention only certain historical aspects involving the bear vis-à-vis serpents, reserving comment on modern survivals of conjoint ursine/ophidian traditions.

Bears figure scarcely at all in several major religions, including the Assyrio-Babylonian and other Semitic ones, and though they were native throughout southwestern Asia there are no references to them in the Sumerian inscriptions on animal metaphors compiled by Heimpel. *Ursus arctos syriacus* was common in Lebanon until 1914. Its habitat included Eretz Israel, where it was populous even in the period of the Mishnah, yet its significance in early Hebraic cult was practically nil.[196] In India one of the two sects of the small Jaina community (the

Digāmbara) identifies their common fourteenth preceptor, Ananta, by a bear symbol but does not venerate the animal itself, while the Hindus ignore it totally in their divine symbolism. In China, the serpent and dragon completely overshadow the bear as a mythic and cultic animal, except perhaps in the shamanistic religion of the Ch'u, a people of northwestern origin who dawn hazily on Chinese history in about 1100 B.C. but without producing copious evidence of their practices until the sixth century B.C. There are only "hints" of a bear cult in Ch'u shamanism and cosmological myths, whereas "snakes . . . figure . . . prominently in Ch'u art and the regalia of shamans as described in the *Shan-hai ching*."[197]

The bear nevertheless exerts enough influence on man in the colder, northern latitudes as to suggest that its existing cults have extremely ancient origins, despite G. H. Luquet's reservations concerning European Stone Age art. According to him, "il n'y pas la moindre preuve, non seulement d'un culte, mais même de croyances quelconques relatifs a l'ours pour les temps anterieurs au Magdalenien [ca. 15,000 B.C.]"[198] Some may dispute this, for, since earlier Palaeolithic times, European cave paintings (for example, in the Pyrenees, at Trois Frères) depict bears as decapitated or pierced with arrows, their mouths gushing blood and men dancing around them. Then, as now, these overt signs of "huntsman's magic" were clearly a part of the ceremonial aspects of hunting a bear that probably also involved expiatory rites. The custom of apologizing to the bear before killing it is widespread among both Siberian and North American Indians to this day. It bespeaks the veneration of an animal that they traditionally addressed as "brother" and whose cubs were adopted by childless couples as "son" or "daughter"—a veneration whose roots probably were interwoven with the huntsman's rituals quite early in prehistoric times.[199]

Still, one cannot draw inferences about the cultic importance of a particular animal from the relative frequencies of the different species in cave paintings or other imagery alone. For instance, those depicted at Font-de-Gaume, France, represent different chronological sequences in a cave complex frequented by man during all periods of the Upper Palaeolithic, about 38,000 B.C. Henri Breuil counted eighty bison, forty wild horses, seventeen reindeer and other Cervidae, eight aurochs, two rhinoceroses, and only one or two felids, one wolf, and one bear. Bears and serpents, on the whole, are scarce in European cave art, but, as I have explained, this is insufficient reason for concluding that bison and wild horses were venerated more and had greater symbolic value. Among the astonishingly large number of paintings in the six-mile stretch of the cave at Rouffignac, France, there are forty-seven engraved and thirty-one painted mammoths, seventeen bison, eleven ibexes, ten rhinoceroses, and nine horses, but no identifiable images of bears. On the other hand, "very large representations of snakes stand out which recall similar figures drawn with the fingers at Baume-Latrone . . . [in] a part of the cave . . . already frequented in the days of Aurignacian man [ca. 30,000 B.C.]". At Baume-Latrone the mammoths measure "up to 4 feet 9 inches in length. . . . [their trunks] rendered by strange zigzag lines, the snake [nearby] is 9 feet 9 inches long, and its head resembles that of a bear with its jaws opened in a threatening manner."[200]

In the ecological and climatic setting of northern Europe and Asia, the presence of the bear cannot have been underrated at any period, and it would appear that the serpent, too, considerably impressed Palaeolithic peoples,

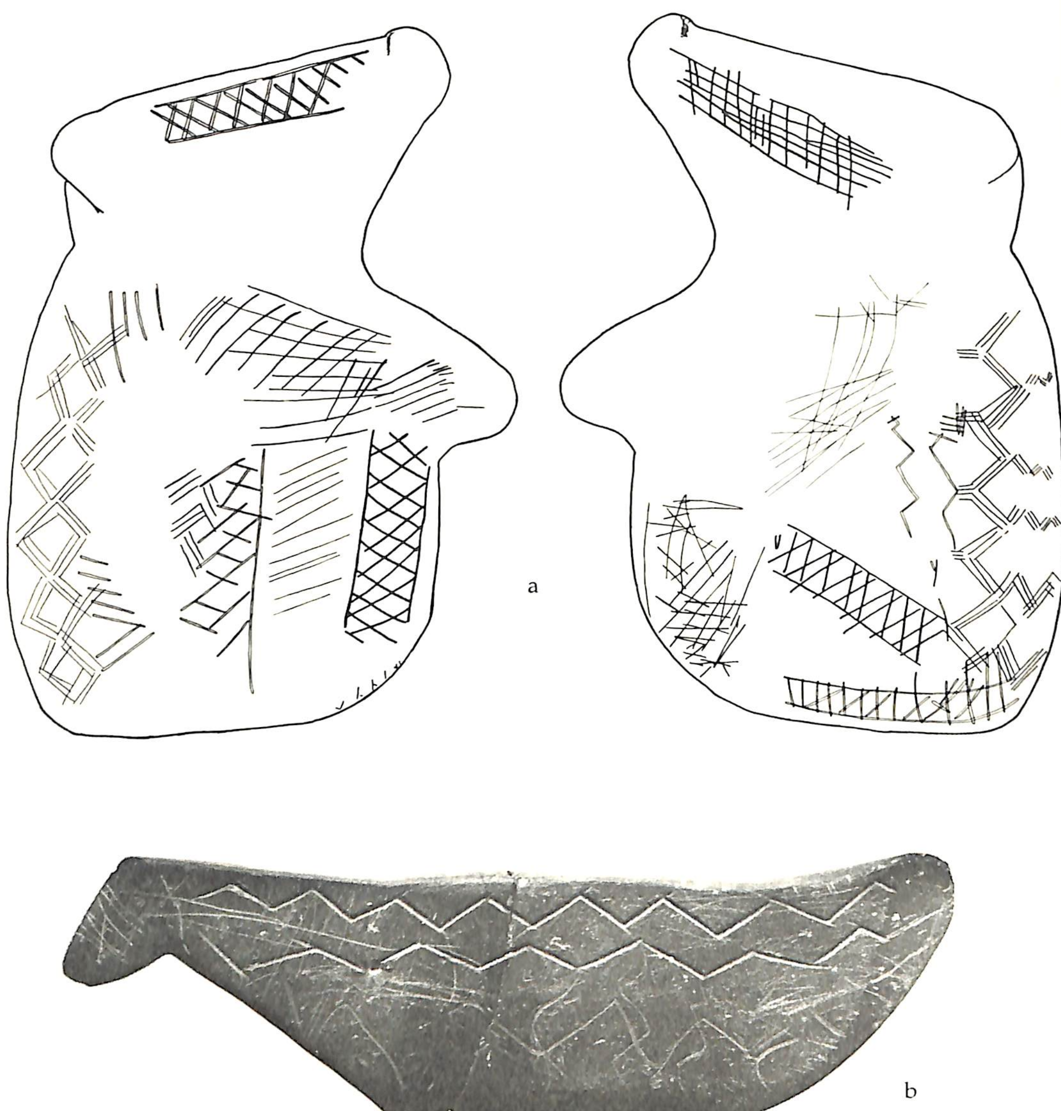


Fig. 76. Conjoint ursine and ophidian symbols in northern European Palaeolithic and Mesolithic art: *a*, amber image of a bear, Maglemose culture, Mesolithic, 10,000–4000 B.C., Resen bogs, Jutland, Denmark, showing two distinct serpents incised on its left flank along with, presumably, other, less explicit ophidian symbols; *b*, slate knife blade in the form of a bear, Scandinavian Palaeolithic, Ulsnes in Aure, Møre og Romsdal, northern Norway, showing zigzag pattern of two parallel lines between which, on the left side, emerges a long, clearly forked serpent's tongue.

whether cave dwellers or not. Bones found in Middle Magdalenian French caves, for instance, carry clearly etched figures of serpents together with horses or fish in addition to notational marks thought to indicate the lunar phases. Thus, apart from these representations of serpents as apparent symbols of cosmic phenomena and fertility and the various ophidian petroglyphs and relics referred to so far, one should take serious note of bear and serpent as animals whose prestige is enhanced by conjoint appearances in ancient art.

Figure 76 shows two important examples: One, a chunk of amber smoothly

sculptured to produce the likeness of a bear, is from a northern Danish bog. It is engraved on both of its sides with patterns which are all seemingly ophidian, since two of the motifs, zigzags with "heads," etched into the left side of the bear indubitably represent serpents. Alexander Marshack remarks,[201]

> Whatever the precise meaning of the bear and its markings it was time factored. . . . symbolic, [a] storied image that was intended to be kept, handled, and *used* in time, including special time. It was not an object of decoration, since it had no hole but had to be held in the hand. Its story or use was, then, repetitive or periodic, and its meaning was continuous; [microscopic evidence shows that] the sculptured ear and nose had been worn smooth by handling. . . . months and years separated the making of the two patterns along the muzzle of the little bear.

The animals represented by the second object (fig. 76*b*), a slate blade from a Norwegian site only about 375 kilometers south of the Arctic Circle, are equally unambiguous.[202] Its handle terminates in the form of a bear's head, and there are two pairs of parallel zigzag lines etched into the blade. From the upper, more distinct pair of zigzags emerges, just behind the bear's head, a long cleft tongue. The Danish icon and the Norwegian blade emblematize an association of bear and serpent that is echoed millennia later by the *ongons*, or amulets, of Eurasian shamanism.

It is proper, therefore, to note at this point that, in addition to the bear, the serpent also occurs in ancient relics conjointly with other species that persist in the paraphernalia of modern shamanism. "Engravings of animals are rare" in Palaeolithic art of the northern circumpolar region, according to Graham Clarke, and "apart from an enigmatic slotted form on bone . . . they include finely incised fish and serpents and cervids." A piece of deer antler (presumably an amulet, judging from its two holes for a suspension cord) carries obvious fish and serpent motifs, and a comblike implement (perhaps a fish scraper or fishnet mender) in the form of an elk with a human head for a tail has zigzag etched lines, perhaps ophidian symbols. Both of these intriguing objects are from Scandinavia (fig. 77), where clearer serpent-elk combinants also occur.[203]

Okladnikov, discussing petroglyphs of the eastern Siberian Amur and Ussuri River valleys dated to the second to first millennium B.C., does not specifically mention the bear cult, though his figure 4b seems to represent a bear's face. As I have pointed out, he does indicate the prominence of serpent, deer, and waterfowl motifs, and he stresses the latter's relationship to the art forms of the modern Nanai of this region, who venerate bears and whose amulets (fig. 54) have prominent serpent motifs associated with those of bears and tigers.

Now, it is well established that, despite ethnic diversity, the chiefly nomadic cultures of northern Eurasia have, since Palaeolithic times, exhibited certainly common features in the subject matter of their "animal-style" art attributable largely to similar modes of life rooted in a hunting-and-gathering economy and an almost uniform fauna. Culture diffusion has played a major role, too, for these various peoples have travelled enormous distances in historical epochs and sometimes still do. Factors like these underline, as Gutorm Gjessing does with special references to northern Eurasia, the importance of adopting a holistic view wherein archaeology draws heavily upon sociocultural information.[204]

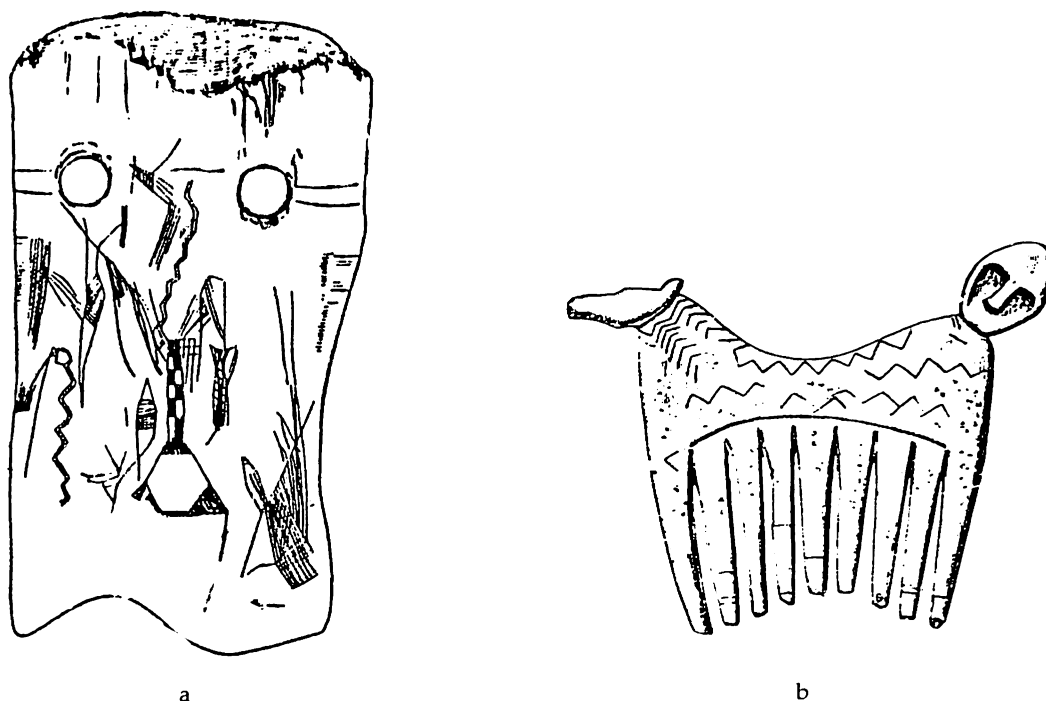


Fig. 77. Conjoint elk, fish, and serpent motifs in northern European art: *a*, deer antler with engraved serpent and fish symbols, Palaeolithic/Mesolithic, Skalstrup, Zealand, Denmark, the perforations at the top probably meant for suspending it from one's body by a cord, as an amulet; *b*, bone comb with conjoint elk, human, and zigzag (seemingly ophidian?) symbols, Gullrum, Sweden.

The cult of the bear, whose ceremonial aspects have many features that are shared by tribal peoples in Siberia and North America,[205] has an important place in any holistic view of religious history. The cult, surely, was carried along with that of the serpent (and other animals) by waves of nomads migrating across the landmass of Beringia. It is conspicuously entrenched today in such more northerly North American tribes as the Ojibwa, the Northwest Coast groups, and many more. This is of great interest inasmuch as the imported religious traditions and styles of art were evolving into divergent forms continuously with the passage of time as the descendants of the immigrants journeyed farther apart and settled in territories inhabited by species of animals new to them. That some of the original traditions were conserved with varying degrees of fervor and others allowed to atrophy is to be expected. Did this atrophy affect the cult of the bear (in the region between the southwestern United States and Andean South America) as much as it has affected the survival of fearsome memories of the serpent (if not the cult) in far northerly regions of the world? The following few points, plus the information in the section immediately following them, may help the reader decide:

There are several varieties of *Ursus americanus*, and, until their populations were exterminated or hunted thin in post-Columbian times, they ranged abundantly from Alaska to Central Mexico. The "spectacled" bear *Tremarctos ornatus*,

now rare, lives in Panama and in the Andes from southern Venezuela to northern Chile. Thus it is remarkable that while the serpent was woven, along with other animals, into the thinking of innumerable tribes in North America,[206] Mesoamerica, and the Andean region, the importance of the bear is scarcely noticeable as one proceeds southward in the Western Hemisphere. For example, frequencies of various motifs found in Nevadan and eastern Californian petroglyphs dating from ca. 5000 B.C. to A.D. 1500, recorded in detail by Robert F. Heizer and Martin A. Baumhoff, show mountain sheep, numbering 259, and serpents, numbering 244, predominating over all other animal forms. The latter figure is a conservative count, simple sinuosities, curvilinear meanders, zigzags, and wavy lines which may represent serpents are not included. Only those motifs are considered which have "headlike thickenings at one end . . . some [of them] unquestionably meant to represent snakes, a few even [having] the rattles of a rattlesnake." Foot or paw marks number 92, but Heizer and Baumhoff specifically discount the possibility that the paws represent bears. Since representations of all quadrupeds (except mountain sheep) put together number only 78, the frequency of serpent motifs seems all the more impressive. Farther south, there appears to be no comparable archaeological example, but the Huichol of northwestern Mexico provide one of the rare examples of a bear deity. They have an earth goddess, Takotsi Nākawe, who is closely identified with crops, such as maize, beans, and pumpkins, and also with the bear. The latter distinction, however, is diluted because the goddess is also associated with the armadillo and the peccary.[208] In Mesoamerica, there is no deity, as far as I have been able to determine—certainly no major one—which has ursine attributes.[209]

The bear is scarcely depicted, whether alone or chimerically, in the animal representations of the archaeologically and ethnographically well-known groups of Andean Indians. The important Andean deity, Ai Apec, has a double-headed serpent attribute.[210] Serpents are prominent in both Mesoamerican and Andean sculpture, pottery, and textiles; bears are conspicuously absent or rare: Edouard Seler mentions a curious bear's-paw form only in connection with a tomb in Colombia.[211] Perhaps the only important case of a plausible bear cult in South America exists in the artifacts of the Tairona of Colombia, a coastal culture with affinities to the Caribbean rather than the populous Andean area. The pertinent Tairona clay objects, large numbers of which seem to have been intentionally (?) broken in rites, include only a few intact excavated specimens, some of which "look like bears."[212]

SURVIVALS OF OPHIDIAN TRADITIONS AMONG NORTHERN PEOPLES

A look at the more northerly, even the circumpolar, regions will help to emphasize the persistence of ophidian motifs among Eurasian and American peoples who, despite their heterogeneity, have historically pursued very similar patterns of subsistence dictated by the nature of their environments. Their lands vary from taiga to arctic or subarctic tundra and are occasionally insular. In their cold and inhospitable terrain, the potential danger of attacks by bears and wolves, and infrequently the tiger, was a realistic and normal consequence of their activity as huntsmen. No other animal was comparable in this regard.

Among harmless animals, elk, marine mammals, the smaller fur-bearing mammals, game birds, and fish were prominent in their economy and in any case commanded their thinking far more than serpents or other equally rarely seen subterranean species. With birds and mammals vying for attention so formidably, it is not surprising that sentiments about the serpent turn out to be less comprehensive or sharply definable than in cultures rooted in warmer climates. What is extraordinary is that memories of those sentiments surface at all, and more than casually.

The serpent has an important place in the tribal mythology of the Finno-Ugric Cheremis, the Yenisei Ostyak,[213] and the Ainu,[214] to name only three. "Animal-style" art is widespread across northern Eurasia. The small carved bone or wooden or metal objects of magical portent, the talismans or *ongons* of Siberian shamanism, comprise a special class.[215] They were used chiefly in the shaman's healing rituals among the Goldi, the Tungus, the Mansi, and the Ul'chi. "The serpent-figure," writes Dmitrii Zélénine in one of the earliest sections of his book on cultic observances of diverse Siberian tribes, "is the most widespread of the Siberian *ongons*"—an assertion that is complemented by K. F. Karjalainen's remark that among creeping and crawling animals the second place also belongs to a reptile, the lizard.[216]

Ivanov's extensive analysis of the different animal motifs crowded together on the Siberian shaman's painted drums reveals that the serpent motif often persists even in those drums which include only a very few other animal species. Thus, only a bear, elk, lizard, or bird may be depicted alongside a serpent.[217] The drum, the shaman's ceremonial hallmark, was customarily suspended from the middle of his yurt, as among the Tuva (Soïte), with effigies of serpents attached to it. His robes were notable for the naturalistic or fantastic ophidian symbols drawn or embroidered and the ribbons with cleft ends, indicating the serpent's tongue, stitched on them. This was true among ethnic groups as widely separated as the Ob-Yenisei Ostyaks, the Altai, and the Tunguso-Manchurian Goldi tribes of the Lower Sungari Basin.[218]

In these contexts, one can better appreciate Siberian *ongons* that are reminiscent of the amber and slate effigies (from the Danish Mesolithic and Norwegian Palaeolithic, described above) of bears with serpent motifs superimposed on their flanks. Specimens of such *ongons* are known from western Siberia, the Eurasian region occupied by Ob' Ugrians, to peninsular Chukotski Poluostrov, in northeasternmost Siberia, whose most southerly point is no more than 260 kilometers from the Arctic Circle and adjacent to Alaska. The ophidian motif is hazy in some of Zélénine's illustrations; for example, in figure 78*b*, the form engraved on the bear's flank *may* be that of a seal (in profile) swimming, though the leanness of its partially visible body counterbalances this doubt. There is, however, no room for doubt in a bear *ongon* of the Gilyak (or Nivkhi)—a Palaeosiberian ethnic group whose direct descendants live today on the shores of the Sea of Okhotsk and in the Lower Amur Basin—for a serpent is quite distinctly engraved in its "belt" together with a lizard and toad (fig. 78*a*). Conjoint motifs like these are varied. An *ongon* from the Irtysh River basin, in western Siberia, is in the form of an erect man with a human face depicted on his stomach (fig. 78*e*). He is flanked on one side by an upright bear, its forepaws on his shoulders and its mouth pressing against his head, and on the other by a serpent, vertical, also pressing its mouth against his head. One would be hasty if

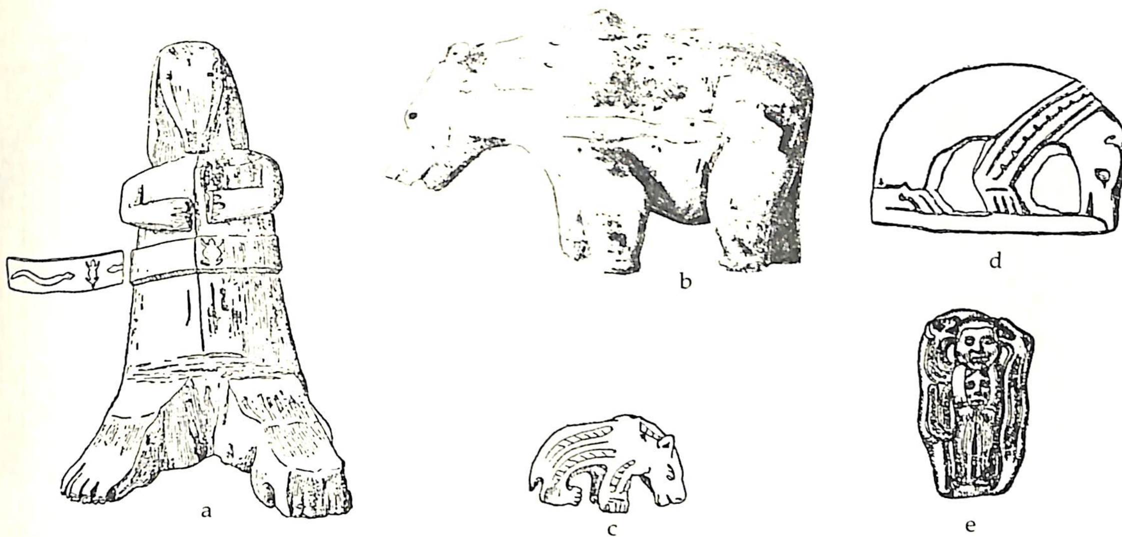


Fig. 78. Siberian bear *ongons*. The involvement of the serpent is clear in *a*, *b*, and *e* but uncertain in *c* and *d*.

one concluded that the animals are this man's antagonists, for *ongons* have a clear role in the shaman's "healing" practices and in warding off misfortune. The undoubted prominence of the bear in northern Eurasian religious ceremonies clearly suggests that the serpent in this *ongon* is on a par with the bear in respect to sacral importance.

Because many different animal species are involved in Siberian shamanism, it is important not to overlook cryptic or abbreviated artistic expressions of ophidian traditions and therefore unwittingly assign them less significance than they merit. The Selkup show this clearly. Their religion was dominated by the concept of a mother-ancestress who was the life-giver of the universe and every morning sent souls (imagined as little birds) into the bodies of women in childbirth. She personified the sun and was addressed as the "mistress of fire," "old lady of the whirling fire," and *selchi shut emysyt*, "mistress of serpents,"[219]—a remarkable appellation, considering the virtual absence of these animals in the homeland of the Selkup Enets, a group of eastern Samoyeds who, prior to post-Soviet Revolution changes in their distribution, lived some 300 to 500 kilometers north of the Arctic Circle, on the right bank of the Yenisei and along the shore of the Yenisei Gulf in the Dudinka region. In folklore, she could assume animal form, such as a sable's, have affairs with men, and ensure their success in hunting a particular animal, in this case the sable. What is noteworthy, therefore, is that the serpent is represented by two of the Selkup shaman's most characteristic effects, a drumstick and a staff (the latter at times replacing the drum as an equivalent attribute) which are normally carried together in the same leather pouch. The wooden staff in figure 79*a* is bifurcated at one end, the tips flared and notched or painted to represent the faces of the "father" and "mother" of fire—clear mobiliary symbols that simultaneously invoke the ophidian tongue, the "mistress of serpents," and her huntsman lover. And were this staff not associated with the drumstick (fig. 79*b*), the latter despite its knobbed

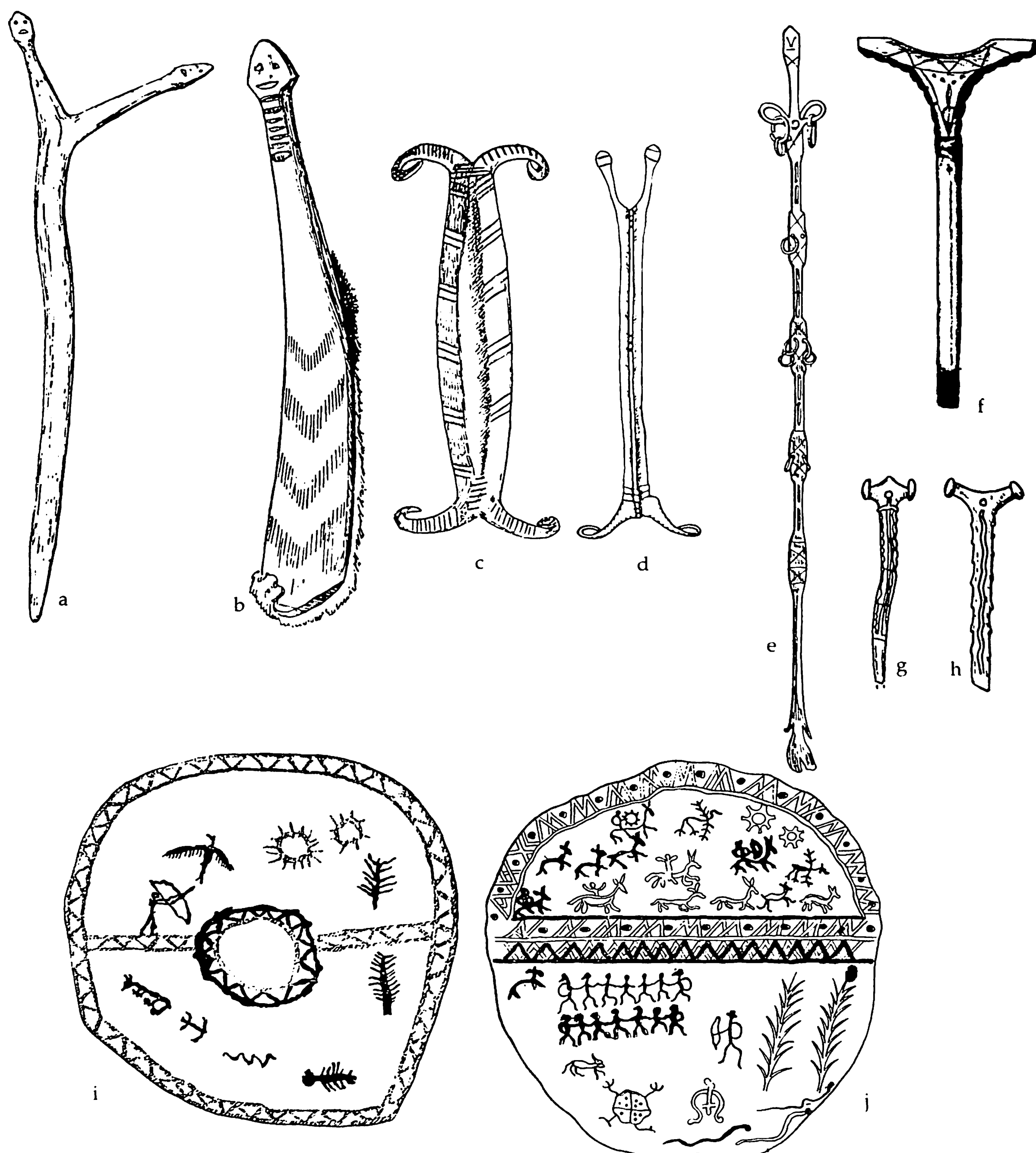


Fig. 79. Siberian shaman's wands, drums, and drumsticks: *a*, representation of the "father" and "mother" of fire, the latter mythical personage being equated with *selchi shut emysyt* or "mistress of serpents," and *b*, drumstick, both Selkup; *c* and *d*, shinbone wands, Yenisei Ostyak; *e*, Enets shaman's staff; *f*, drumstick, "modern" Lapp (Same); *g* and *h*, wands from the northern Caucasus; *i* and *j*, designs painted on the drums of Altaic tribes. The V-motif in *e* (top) occurs in an ophidian context in fig. 40c.

handle might not suggest itself as an image of the mother-ancestress nor the shape of the knob hint at a serpent's head or the notches beneath it a serpent's ventral scales. Figures 79*c* and *d* show two other bifurcate staffs whose symbolism is even more covert, but the most cryptic one of the group is specimen *e*. Ye. Prokofyeva suggests that the latter is a zoomorphic "deer-staff," which it may be, since the lower end is hoof-shaped. The key element, however, is probably the simple V-shaped, seemingly lingual emblem at the upper end. At first sight it is apt to be unimpressive, but whether its significance can be traced back to a far earlier epoch is a most intriguing question, since a similar emblem, obviously signifying a serpent's tongue, appears on the forehead of a personage (representing a solar/serpent cult) whose image is engraved upon a stone slab of the Upper Palaeolithic period discussed in another connection with reference to figure 40*c*. One may conjecture, not unjustifiably, that the V motif on this stone monument may have a continuity that stretches into modern western Siberian shamanism, for the monument was discovered near Minusinsk in the Upper Yenisei River basin, whence the contemporary Selkup Enets may have migrated to their far-northern home on the banks of the same river.[220]

The Tungusic peoples of east-central Siberia are quite distinct from the Selkup Enets but, like most Siberian peoples, greatly venerate the bear. The Evenki, for example, have firm notions about their relationship with this animal, which they regard as their kin and address by such epithets as "uncle," "little brother," and "grandfather." Bears, in tribal belief, are organized into their own clans and are said to fear only one thing—their kinsmen. Extremely elaborate rules, including kindness and apology, govern the ritual hunts and feasts upon bear flesh, but an important feature of these ceremonies is the nonparticipation of the shaman. By contrast, though neither he nor the tribesmen worship the serpent, this animal's role of "ancestress" is acknowledged twice during a chant in the Evenki shaman's seance as he acts out its sinusoid locomotion and points to the sun's course.[221]

The tribes of the Northwest Coast of Alaska and Canada, practice forms of shamanism in many ways comparable with those of Siberian aborigines—a not unexpected consequence of their ethnogenetic roots in Northeast Asia dating back at least to the last Ice Age. The variety of animals in their mythology is great, and the relative paucity of reptiles in their fauna is as remarkable as the importance given to them in cult. In the Nootkan *klukwana*, a sacred ritual dance, the Ha-et'lik (literally, "lightning-serpent") is a favorite character participating in the mythical "belt of the thunderbird." Symbolizing the tongue of a serpent, the Ha-et'lik always dances next to the thunderbird. The Haida shaman's batons are decorated with serpent motifs and sometimes with the thunderbird. In the Kwakiutl dance ritual called *hamatsa*, actors impersonating birds that devour human flesh have the central role. The ritual itself was more popular than the *winalagilis* dance, whose most important feature was the invocation, from underground, of a board carrying the motif of a double-headed serpent. Yet the *hamatsa*, unlike the much older *winalagilis*, is known to have originated only in 1835 and to have been borrowed even more recently by the Tsimshian and Haida (of Skidegate), the neighbors of the Kwakiutl; the northernmost Tlingit apparently never adopted it,[222] though their shamans did employ double-headed batons.[223] As we have seen, in the wolf dance or *klukwalle* the shaman dances with a rattle-staff decorated with a double-headed serpent.[224]

The Northwest Coast tribes, particularly the southern ones, embody the serpent in a marine, riverine, and, as occasion demands it, terrestrial creature they call *sisiutl.* While in myth it assumes several forms, such as a salmon's or a squirrel's, on shaman's staffs it often has a stylized, nondescript zoomorphic head at each end and a human head in the middle. Lest the term "serpent" be regarded as a misnomer in these shamanistic contexts—a zoologically unverifiable species produced by mythologizing and artistic bastardization—the reader is asked to consider figure 32 and the following authoritative field anthropological opinions. According to T. F. McIlwraith,[225]

> Snakes are regarded with aversion and disgust. . . . The Bella Coola believe that snakes are the offspring of a supernatural *"Mother of Snakes"* [my italics], a mythical being of dread powers [a title precisely like that employed by the Siberian Selkup]. . . . The *sisiutl* is a double-headed salmon or snake that can travel on land. . . . many Rivers Inlet shamans have received their powers from [*sisiutl*] which is accordingly well known to the Bella Coola in this connection. [A shaman sings of the *sisiutl* during his dance] since [it] had told him to employ his power beneficially and had further instructed him in the use of the rod [wand or staff] in which it lay. . . . To attain purity or cleanliness, on the way to becoming a shaman, one must . . . eat small portions of the tails of snakes and heads of frogs.

Franz Boas[226] and Audrey Hawthorn[227] leave little room for doubt about the identity of the archetypal animal when they refer to the *sisiutl* as a "double-headed serpent [with a] serpent head at each end and a human head in the middle" or "whose body is a face."

The subtleties of symbolic representation and the polyvalent animal forms normally involved in Northwest Coast Indian art are illustrated in figure 80 by four objects, of which only the painted drum *(a)* belongs to the southernmost tribe, the Nootka. It depicts a whale being carried off by the thunderbird, above whom is Hahektoyek, the mythic serpent that represents lightning, whose head in this painting is more like a wolf's than a serpent's. The mask in *b* belonged to the chief of the northernmost branch of the Haida, at Kasaan, Prince of Wales Island, some 1,000 kilometers south of the Arctic Circle. It has a pair of movable eyes and is surmounted by an openwork frame modeled on the traditional Haida gabled painted housefront, which often bore the fearsome *sisiutl* sign. Two stuffed-cloth bifid tongues hang from each corner of the mouth, i.e., with a human face in the middle, thus fully conforming to the essential features of the double-headed ophidian *sisiutl* evident in the shaman's wands of figure 32. Symbolically, these bifid tongues and the drum motifs in figure 80*a* are inseparable, for iconographic studies by M. Badner show that *sisiutl* assumes thunderbird as well as whale aspects (Upper and Lower Worlds, respectively) and is simultaneously the symbol of both.[228]

Most intriguing of the group in figure 80, however, are *c* and *d*, both belonging to the Alaskan Tlingit, northernmost of the Northwest Coast Indian tribes. In *c*, a shaman's wand, the double heads are "wolf"-like but no different from the serpent Hahektoyek's head in the Nootka drum just mentioned, the wand itself being of the *sisiutl* type, though artistic license has reduced the human head in its center to merely a pair of arched holes. This wand features octopus symbols beneath the terminal heads—symbols that are repeated importantly in *d*. This is a Tlingit shaman's head ornament representing a land otter and an octopus, the latter identified by the sucker discs on the tentacles constituting the



Fig. 80. Northwest Coast Indian shaman's effects: *a*, painted drum, Nootka, showing the thunderbird Hahektoyek (regarded as but an aspect of the serpent according to a dualistic/monistic concept) carrying off a whale; the serpent's naturalistic body form contrasts sharply with a stylized face that is quite unophidian yet suggestive of no other species; *b*, polychrome wood mask, northernmost branch of the Haida on Prince of Wales Island, Canada, with symbolism befitting the elemental notion of the *sisiutl* as a double-headed serpent with a human head in the middle (see fig. 32); *c*, Tlingit shaman's double-headed wand with a "wolf's" (?) head which, however, is little different from that of the serpent in *a*; *d*, Tlingit shaman's head ornament in the form of a land otter and octopus tentacles, represented either as the animal's tongue (or, less likely) its food.

tongue. It is from the grave-house of an old shaman and owes its significance to the central importance of the land otter, in Tlingit superstition, as an animal that is repugnant and greatly feared, though it is quite innocuous. The octopus, by contrast, has little significance and is neither feared nor eaten nor included in the list of Tlingit totemic animals. To identify the octopus tongue as "bifid" and "ophidian" would be too simplistic, for of the innumerable Tlingit objects I have had access to in the collections stored at the American Museum of Natural History none justifies this belief. Yet, the situation I find most intriguing—the importance attached to the *tongue* in Tlingit shamanism—stems not so much from art as from the morbidity and prominence of apparently ophidian themes that crystallize as *sisiutl* (or its equivalents) in the mythology of the Northwest Coast Indians as a whole. "The most important part of the [Tlingit] shaman's equipment," Frederica de Laguna informs us, "was the bundle containing the tongue of the [especially dreaded] land-otter or other creature he had killed during his novitiate. . . . [it was] worn as a neck charm by the shaman when practicing on the sick. . . . At other times it was kept hidden far away."[229]

The Eskimo show even more cryptic persistences of traditions which may once have been rooted in repugnant sentiments about reptiles. "Tell me something about your religion; what do you believe?" the explorer Knud Rasmussen is reported to have asked an Eskimo during his explorations Northwest of Hudson Bay. "We do not believe," was the reply, "we only fear. And most of all we fear Nuliajuk. . . . Nuliajuk is the name we give to the Mother of Beasts. All the game we hunt comes from her; from her come all the caribou, all the foxes, the birds and fishes. . . . We fear those things which are about us and of which we have no sure knowledge. . . .the spirits of earth and air. . . . great and terrible as mountains." Fantastic spirit creatures haunting a certain *angakok* (shaman) both while asleep and awake reportedly impressed him so much that when asked to draw pictures of his hallucinations he only lapsed into deep thought, trembling with emotion to such a degree that he could scarcely draw.[230]

About the modern Arctic Eskimo, Ernest S. Burch observes that his informants were highly influenced by American ways but viewed reality in much the same cognitive framework that had guided the activities of their ancestors. How could intelligent, literate, well-travelled individuals, he wonders, talk with such conviction about their experiences with evil shadows, monsters, and ghosts, particularly when they had been devout Christians for over half a century? They believed in giant fish, giant birds, a giant shrew, and a giant mouse, in this order or prominence, but placed "dragon-like" creatures in a special category. The first group were ascribed all manner of prowess, such as the ability to carry away or swallow fantastically heavy loads of prey. One avoided harm simply by hiding from them. The "dragons," however, dwelt in freezing lakes and, though dangerous in theory, were seldom a threat because they were few and everyone knew where they were and so avoided encounters.[231] In a colored pencil drawing by a modern Caribou (or Inland) Inuit Eskimo woman (fig. 81*a*), two enormous, almost naturalistic serpents dominate the composition. A band of Eskimo are shown slashing them with knives. The drawing is of interest, even if non-Eskimo influences inspired it, because the Inland Inuit of the Baker Lake region dwell only 250 kilometers south of the Arctic Circle in harsh terrain in which serpents are virtually never seen.[232]

Among the traditional walrus ivory sculptures of the Eskimo collected by

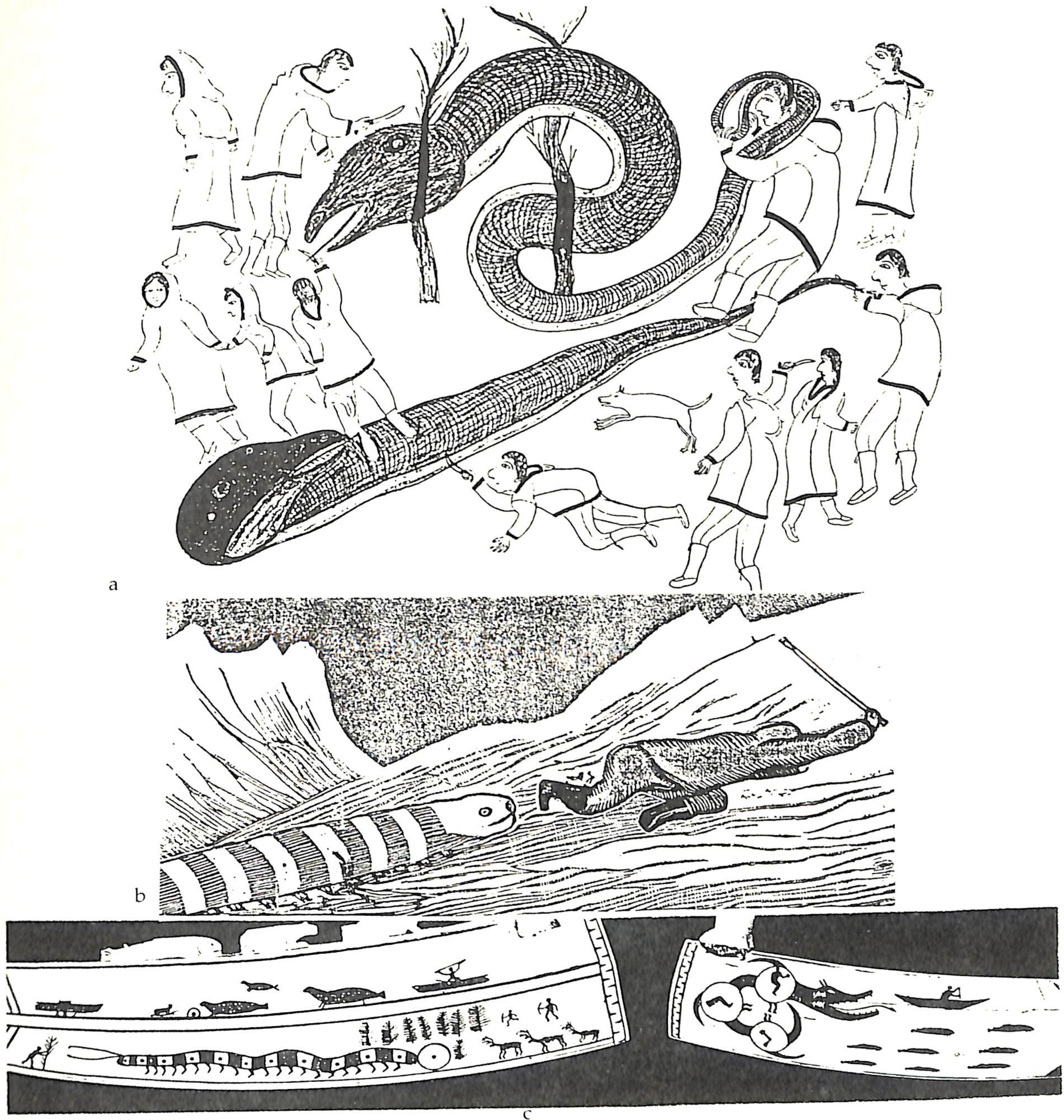


Fig. 81. Fantastic creatures in Eskimo art: *a*, untitled, colored pencil sketch by a young tribeswoman, Janet Kigusiuk, showing Inuit (or Caribou) Eskimo slashing two almost naturalistic serpent-like creatures; *b*, woodcut from an 1860 Eskimo book showing a southern Greenland Eskimo fishing at a blowhole, oblivious of the centipede-like monster creeping up behind to attack him; *c*, details of the decoration on two walrus ivory pipes of the late nineteenth century showing (left) the dreaded monster *tirisuk* and (right) the *palraiyuk*, poised to destroy man.

the Point Barrow polar expedition of 1881 before acculturation had influenced their art are several important renditions of mythological creatures. One, of a giant polar bear, apparently represented a belief widespread in Alaska from Norton Sound clear up to Point Barrow, 600 kilometers north of the Arctic Circle. Called *kokogiak,* this monstrous bear had ten legs, which it waved about frantically while lying on its back in order to lure and devour hunters by simulating marooned persons signaling for help. It was so enormous that from ear to ear it measured about the height of a man and so heavy that it could break through a wall of ice. There was also a giant eagle *(tingmiakpuk),* the subject of myths of gaiety, song, and dance, besides other mythical creatures. What is extraordinary, however, is that Eskimo art fostered two serpent-like forms in an environment in which caterpillar and centipede are no more in evidence than the serpent during the all too brief summer of the Arctic tundra. The *tirisuk,* portrayed in engravings and carvings as a gigantic "caterpillar" with a pair of antennae (normally absent at this stage of insect metamorphosis), lived in a huge hole and was feared by all but the Kotzebue region Eskimo because its powerful antennae could pluck off boatmen. Another mythical reptile, the *palraiyuk,* too, was an aquatic creature that chased and devoured Eskimo and their kayaks. In a modern woodcut impression, it is a serpentine monster and not the bear *kokogiak* that creeps stealthily from behind towards an Eskimo absorbed in his fishing at a hole in an icy sea or lake (fig. 81*b*).[233]

For our final example of a circumpolar people we may consider the Teutons, particularly their Nordic representations. Until Christianization in the middle or late first millennium, their imagination fostered strange reptilian monsters which, presumably, were conceived millennia earlier in the minds of their ancestors hailing from warmer latitudes in which serpents are plentiful. Particularly sacred to the Teutons were ravens, cattle, horses, and giant boars, along with rocks and trees. All these were worshipped not so much for themselves as out of a belief in personal, *unseen,* i.e., unidolized, gods whose mouthpieces they were. Thus the raven that guided the seafarer, especially the Norseman, may have embodied a god, whether Ódinn or some other. Ódinn himself was capable of assuming the forms of serpent, wolf, horse, eagle, or some other animal at will. A divinity might even be transferred to, and embodied in, the phallus of a dead horse and venerated or called a god in the sense that the force or spirit of the fertility god Freyr was embodied in it. Neither raven, cow, horse, nor boar can be said to have been selected as divine symbols by virtue of its intrinsically fearsome animal qualities.

In Norse traditions, on the other hand, the raven and the wolf (and sometimes the dog) are the cruelest demons of death and destruction. They thrive on the battlefield, on the blood and corpses of fallen warriors. A pair of ravens perched on Ódinn's shoulders and were daily sent to all corners of the earth to gather tidings and then whisper them in his ears. The warrior is the man who "reddens the wolf's teeth." In his most sinister and evil aspects Ódinn himself assumes the guise of a wolf. The most vicious of all wolves is Fenrir, who, chained, strains constantly to spring upon the dwellings of the gods and man alike, destroying when he can all before him. In this scenario, the serpent is all but forgotten, for Fenrir is not merely the offspring of Loki and the giantess Angrboda (the "Presager of Evil"), but also the brother of the death goddess Hel and of the World-Serpent Midgardsorm (Jörmungand).

In Norse myth it is Thór, the most powerful and noblest of the gods, who is called upon to pit his strength against and quell this monstrous serpent, his most formidable opponent, known as the "hideous thong of the sea." In one version Thór strikes off its head, but in another he fails to kill it, and it will survive until Ragnorök, the day of reckoning, when each will destroy the other. Until then, it lives unconquered, coiled around the sea encircling the world. For this role the wolf and the raven, despite their awe-inspiring reputations are obviously corporeally unsuitable, but, more importantly, they also prove to be feebler than the serpent as symbols of unpredictable, lurking terror. Thus, it is a commentary on the power of evil that, in the Eddaic lays, Thór, the bold opponent of the serpent, is placed in the background, even derisively so, while Ódinn rules supreme.[234] Ambivalent awe of the serpent, as the preferred symbol of good fortune and protection, persisted in Scandinavian traditions until the late nineteenth century. G. Ränk[235] discusses at length the house-snake, sometimes represented by a live or dead viper, which was sealed in a hole especially bored for it in the section of wood forming the main doorstep of Swedish houses.

Just as in the tropics, so also in the far north, it would seem, other species of the local fauna do not succeed in blunting the force of the serpent's appeal to human imagination.

CHAPTER 4

The Serpent as Sexual Symbol

CONCEPTUAL ASSOCIATIONS

Influenced by psychoanalysis, whose tenets and outlook they cannot entirely eschew, symbolists tend to invoke the serpent in analogies involving human sexuality more readily than in enquiries as to whether, or why, other species may not provide an equally effective stimulus for analogizing. Scores of species, among them the canids, exhibit sexual behaviors that are far more easily observable and certainly more titillating than the serpent's. Yet Freud and his followers grant this animal (and also twenty-one *inanimate*, long, stiff objects) the distinction of being "one of the most constant and invariable [at least subconscious] symbols" of the phallus.[1] This tenet invites scepticism, but it has at least the distinction of being founded upon several ironies that redound to the mystery of ophidian form, behavior, and "repulsiveness." As a rule, the serpent's simple shape, size, and color patterns afford no striking clues of sexual dimorphism. Even specialists must inspect a specimen closely to identify its sex, since

the penis—or, rather the hemipenes, parts of a bifurcate organ normally concealed in the cloacal (or excretory-genital) opening at the posterior end where the animal's true tail section commences—is quite small and not visible unless it is everted during copulation. Apparently, to some symbol makers (scholars as well as laypeople expressing their traditions), the serpent's entire body suggests itself as a super-penis. By the same token, so should snake-gourds and bananas, but these have engendered much less theorizing.

There is no question but that the serpent, in *some* cultures, has incited a powerful genital symbolism ancillary to the cult of fertility and the deities that preside over it. Ironically, the secluded niches inhabited by serpents, and also seasonal factors, greatly reduce the opportunities of observing their reproductory peculiarities. Mating behavior itself is unlikely to be recognized by most nonherpetologists as distinct from other more open types of associations between two individuals not engaged in sex play. These pairs are presumed to be of opposite sex though, in fact, as often as not they turn out to be males on the forage together or engaged in combats that are often mistaken for sexual activity. In any case, they have given rise to many misconceptions involving alleged sexual partnerships. Perhaps the most universal of these is the belief that an individual whose partner was killed is so loyal to it, and so vengeful, that it will ultimately overcome hurdles and unerringly seek out and destroy the killer—feats quite beyond the capacities of an animal so primitive in its brain structure that every phase of its social and reproductive activities is mechanical and determined by transient changes in its body chemistry. This baseless belief is strong among peoples whose curiosity about the sexual activity of serpents is seldom accompanied by the knowledge that the mechanics of copulation can superficially be mimicked by a pair of males locked in instinctive combat "dances" which, actually, are prenuptial seasonal displays. This confusion is the source of many myths.

Thus, the lascivious or fecundity aspects of these myths involve two distinct, but to the nonzoologist inscrutable, behavior patterns, each of which can be quite prolonged. Copulating partners curl around each other only by their extreme posteriors, the male flicking his tongue very frequently to the accompaniment of a pulsating or pumping action at the tail end or longitudinal contractions, depending on the species. Locked pairs may or may not separate easily in the presence of an intruder. Rattlesnakes normally lie locked for 6 to 12 hours, and instances of pairs locked for at least 22¾ hours have been recorded.[2] Coitus among cobras is known to last intermittently up to three days. Of one pair it is reported that they "nodded their heads continually, and their bodies quivered. They did not take the slightest notice of anybody in front of their cage. They did not expand their hoods. . . ."[3] Such heedlessness may not prevail during the combat "dances" of male pairs, as they are apt to disengage from actions erroneously regarded as "lovemaking" and attack an intruder. These combats, which are "instinctive in several families of snakes on all the continents [and go] back to the dawn of snake history," also involve body contact. Elevating of heads for mouth-to-mouth contact, pushing, bobbing of heads, and entwining of bodies, too, may seem to be prolonged amatory gestures, but rattlesnakes, for example, are known to attack viciously during the mating season, when most of these combats take place.

The prolificity of female serpents can be as impressive as their reputed lust.

Many species lay eggs by the score. Cobras lay up to forty-five, reticulated pythons about a hundred; rattlesnakes and some other vipers give birth to from eight to twelve or more offspring ovoviviparously (i.e., the young emerge from eggs maturing within the mother's body). Many species tend to colonize dens under rocky ledges and in secluded niches, where they pile high on top of each other and lay eggs in aggregations of hundreds.[4]

Behaviors like these have considerable potential for impelling symbolic thought. The caves of the Upper Palaeolithic of France, for instance, have yielded an etched bone representing a serpent that some think is gravid on account of its fullness and the eggs suggested by adjoining circular symbols. The artistic motif of entwined serpents, known in Sumerian and Assyrio-Babylonian art as early as the third millennium B.C., and also in Indian and Chinese art, is more likely to have been inspired by the "dances" of fighting males than by the more covert activities of the copulating pairs supposedly represented in these artistic themes (fig. 82). The insignia of Hermes, the kerykeion, and the symbol of the medical profession almost surely were inspired by fighting male *Elaphe* of southern Europe, whose lyrelike interlocked configurations—in which they lunge at each other repeatedly—are the result of an elaborate ritual that begins with headlong rushes at each other when two rival males meet.

Generalizations about the phallic, vaginal, and even fecundity symbolism of the serpent are impossible because of the diversity of cultural traditions the world over. The ancient Egyptians and Hindus exemplify this specifically in relation to the cobra, an animal that commanded their attention inordinately. Its sexual symbolism is quite obscure in Egypt, despite an abundance of erotic objects, "dolls," and fetishes of a secular nature. The glyph "coitus" consists of a semicircle with three dots on its diameter, indicating the vagina penetrated by male genitals, portrayed naturalistically. Divine sexuality was indicated on the walls of temples with no reference to the cobra, despite its divine associations. The serpent Sito, for example, appears prominently in creation myths, but the god Min has no ophidian attributes, though he is typified as ithyphallic. Isis takes the form of a small bird, not a serpent, when she lays herself open to Osiris, shown mummified.[5] Boat-shaped pottery vessels in the form of human pudenda, obviously used in fertility rites involving steatopygic female statuettes, are bereft of ophidian symbols of any kind.[6] The Egyptian fecundity deity par excellence is the goddess Thoueris, portrayed as a gravid hippopotamus, but no deity, male or female, presided primarily over human fertility (or sexuality) as explicitly as the Hindu goddesses Mudammā and Manasā, both of whom are symbolized by the cobra. Phallicism, to the Hindus, is epitomized by the major god Śiva, whose most abstract iconic form is the phallus, sometimes shown with a cobra coiled around it. Erotic episodes in the myths of Śiva[7] are legion, but the cobra figures in none of them. It is no more than an appropriate, deadly iconographic emblem for a god whose primary function is the cyclical destruction of the universe. The cobra is not Śiva's alter ego, but the equally important god Viṣṇu (who has neither phallic nor fecundity significance) is conceived as corporeally continuous with the multihooded, enormous cosmic serpent Ananta (or Śeṣa). Hindus worship *nāgas* and *nāgiṇis* as harbingers of fecundity, yet, Indian serpent lore represents these male and female cobra semidivinities as essentially vicious, insincere creatures that emerge from their subterranean kingdom in human form to corrupt, cheat, and seduce mortals. The marriage of maidens and ser-

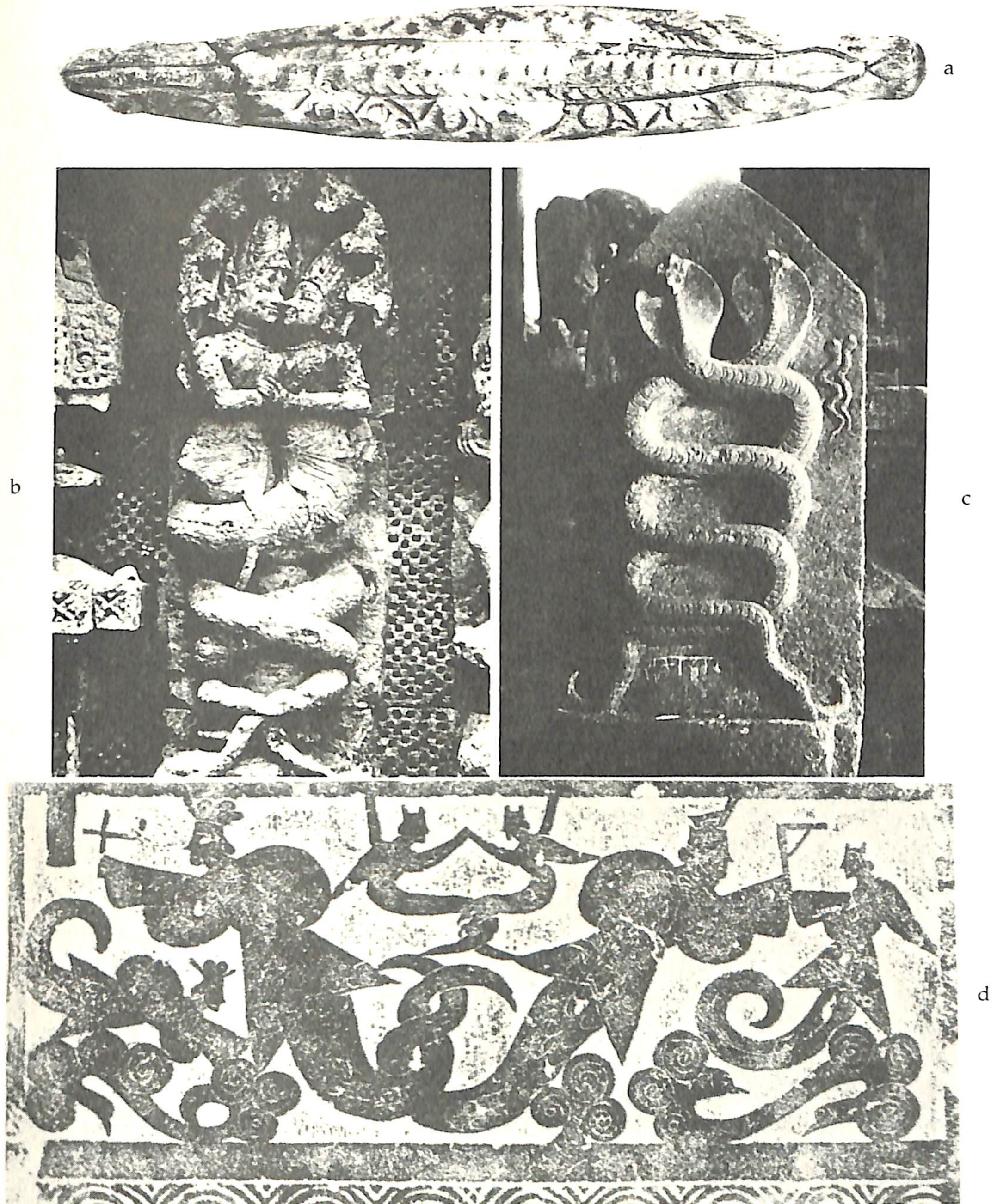


Fig. 82. Serpents as symbols of fecundity: *a*, engraved and shaped object of antler, Middle Magdalenian, Lorthet, Hautes-Pyrenees, France, probably ritual as evidenced by the polish and wear from handling along its edges and deterioration of the more faintly engraved lines, showing a serpent, perhaps gravid, and circles adjacent to it possibly representing eggs; *b*, *nāga* and *nāgiṇī*, stone sculpture, thirteenth century A.D., Sun Temple, Konarak, India; *c*, *nāga* and *nāgiṇī* with offspring, stone votive slab, ca. seventeenth centry A.D., Goa, India; *d*, rubbing from a stone engraving from a Han-period tomb, second century A.D., China, showing two demons, Fu-Hsi and Nu-kua (the latter's surname Tsang-ting means "source of vegetation") intertwined by their ophidian tails. (Fu-Hsi laid down the precepts governing all human relationships, especially matrimony.)

pents is an oft-repeated theme in the myths of certain aboriginal tribes of India. The outraged kinsmen of the girl generally kill the groom, but not before he has fathered a horde of serpents and insects. They regard the serpent as "ignoble," fear it, and link it with incest, but explicitly choose the leech as a sexual symbol.[8]

Incongruities like these make one sceptical of generalizations about "universal" fertility symbolism and male or female "meanings" of the serpent. Artistic motifs like the one in figure 82*a* are rare in the caves of Palaeolithic France and Spain, whereas gravid bison, horses, and bears are amply portrayed in the wall paintings, and, at least in etched bone relics, bears, bison, and fish occur close to *human* phallic, vulvar, and fertility symbols. Portrayals of serpents are unknown in these contexts.[9] This may be because reptiles were not so much a scourge in Ice Age Europe as they are in the tropics; yet even tropical people with extensive ophidian traditions do not always emphasize the sexual role of the serpent as strongly as many symbolists do. The southern Bantu tribes of Africa, for example, have a very large variety of male dolls that represent the phallus and female dolls with exaggerated pudenda and breasts. They use these ritually as charms to secure romance, marriage, or fertility and as toys to instruct young boys and girls in the techniques of sex. Yet, despite the popularity of the serpent motif in African art in general, these important fertility cult figures feature no ophidian symbolism.[10] The serpent has a role in maternity, as a protector during childbirth. However, Bushmen and Bantu-speaking peoples in general associate the animal more typically with the spirits of ancestors, rain, sorcery, sickness, the prosperity of crops and cattle, and medicine, rather than with sex organs.[11] And in all their tribes, as with European cave man and every other people worldwide, it is not the sex drive, but elementary fear and dislike of the animal that primarily prompts its adoption as a symbol, on occasion as a symbol of sexuality.

In Chinese myths about fecundity, young men and women have trysts on riverbanks in order to benefit from the foam and mist supposedly left behind by mating dragons. Though even its saliva was believed to make a woman pregnant, the dragon had neither male nor female genital symbolism. Female genitals were symbolized by cowrie shells. Phallus-shaped ceramic and stone objects found at sites dated to at least the early third millennium B.C. bear inscriptions devoid of any ophidian symbols or glyphs for dragon. They bear, instead, triangular signs of the kind known in the Honan oracle script—signs which, in later script, are identified as *tsu*, a phallus-shaped pictogram meaning "ancestor." In Taiwan today, serpent's penis is recommended not as an aphrodisiac, but for curing liver, kidney, and gall bladder complaints. In general, Chinese sentiments about the animal betray abhorrence far more than genital symbolism. In shadow plays and opera, the "Tale of the White Snake" is an ancient, oft-repeated theme: Briefly, the earliest version recounts how a pilgrim, taking pity on a weeping girl, takes her home and weds her. They live in perfect happiness for no more than ten months, when, immediately after giving birth to his son, she changes into a long white serpent, devours the infant, and then bites her husband fatally.[12]

In Japan, serpents are generally identified with jealousy, envy, and passion, and those that "seduce and deceive are usually female and assume the forms of women . . . this follows the established pattern for ghosts . . . and other beings fearful to man are ordinarily thought of as females who persecute men," accord-

ing to M. E. Opler,[13] who denies that the serpent has phallic meanings in that country. The feminine associations, I believe, are typified in the myth of Kiyohime, a beautiful girl who, frustrated in her sexual advances to a handsome priest, turns upon him "with hate in her eyes [to give him] a lashing with her tongue . . . suddenly her mouth [spitting] flames, her neck and head transforming into those of a huge snake." She pursues the escaping priest, encircles him in her coils, and ultimately sears him to death. In Japanese myths incarnation as a serpent is the punishment for misdeeds committed in an earlier life, and to this day, the shrine of Kiyohime, the *hebi-zuka,* a rock under a tree that personifies her, is said to attract people. Some drive nails into it demanding favors, usually aid in wreaking vengeance upon enemies, and threaten to drive more if they fail.[14]

Because fear and ambivalent awe of the serpent are the only common factors manifest cross-culturally, it is cast in varied mythic roles that preclude any psychoanalytic generalization as to which of its sexual associations—phallic versus vaginal, fecundity versus abortifacient, secular versus divine—is the stronger. In ancient Semitic religions, deities with ophidian attributes who preside over fertility are prominent. Yet, when Pḥlt, daughter of the sun goddess Šapš, demands "adders . . . sons of asps . . . serpents as love gift and *mhr* [marriage price]" from her suitor Ḥoron, neither fertility nor eroticism is implied, but only a terse condition laid down that serpents infesting the land be captured by him first as bride-price.[15]

Almost as a rule, the serpent in the New World is not a human fertility symbol comparable with the Mesopotamian or the Hindu. In pre-Columbian Mesoamerica, phallicism was devoid of serpent symbols. The Maya, for example, practiced no phallic cult in any form, and it is uncertain whether the Yucatec Maya, the Itzá in particular, practiced it before they were influenced by the Toltec invaders from the Mexican plateau. At Chichén Itzá, however, the Maya-Toltec deity Kukulkan (the equivalent of the ophidian Quetzalcoatl) in his variant aspect of Ehecatl was linked with a possibly distinct phallic cult. At this metropolis, Ehecatl is portrayed as an anthropomorph seated on his buttocks, knees folded, penis erect, but there are no suggestions of ophidian phallic associations.[16] In fact, neither Ehecatl nor Quetzalcoatl-Kukulkan had any special phallic cult significance for the Toltecs. The goddess Tlazolteotl, the only major Mexican (Huastec-Aztec, earth) deity linked—some think dubiously—with erotic sex, appears with a serpent symbol,[17] but she presided primarily over witchcraft and filth. The relics of the little-known, apparently ophiolatrous Chaco-Santiagueña culture of pre-Columbian Argentina include anthropomorphic/ophidian clay images, but typically these have breasts and represent females.[18]

Ophidian involvement in sexual symbolism is no more remarkable elsewhere in the Americas except insofar as it denotes the repugnant rather than the beneficent qualities of the serpent. Diegueño youths in California painted rattlesnake emblems on rocky outcrops as threatening reminders of the punishment awaiting them if they disregarded tribal laws learned during puberty rites.[19] The Páez of Colombia shortly before 1946 drained a sacred lagoon because a serpent that dwelt in it—no divinity he—was believed to seduce young maidens.[20] The fertility deity of pre-Columbian Bolivian Indians, Ekhakho, was totally devoid of ophidian attributes, while two other major deities, Yaurinka and Huayra-tata

(connected with earthquakes, thunder, storms, and water), were, respectively, a lake-dwelling monster-serpent and an anthropomorph with coiled serpents as his symbols.[21] In Bolivian Quechua myths, menstrual fluid attracts serpents to the vaginas of sleeping or inebriate women. In one such myth, the rapist-serpent waxes fat and red on menstrual blood and is discovered and bludgeoned on the head, but not before his victim has aborted a multitude of baby serpents.[22] The western Amazonian Cubeo claim descent from the gigantic anaconda but regard the boa constrictor as a killer of women in childbirth and the land boa as a rapist who impregnates them in manioc fields and fathers a brood of serpents.[23] Rapist or abortifacient serpents are legendary worldwide, even among northern peoples like the Bella Coola[24] and the Ainu,[25] in whose lands tradition fosters such beliefs more than is warranted by actual encounters with reptiles. In addition, a variety of local species may substitute for the serpent in sexual contexts in diverse cultures, though perhaps, with one notable exception,[26] not quite as terrifyingly or spectacularly.

That caprice determines which animal species is chosen as a symbol of male sexuality needs little elaboration. Claude Lévi-Strauss analyzes several South American myths in which the frog, otter, and numerous other species have erotic associations. In these myths human imagination is unrestrained by the incongruity of linking frog as well as serpent with an excessively long penis, but in contexts of terror it is specifically the latter animal into which such a penis becomes transformed. In a Bolivian Indian myth, the penis of a man copulating with the moon became so tremendously long that he had "to put it in a basket, where it coiled up like a snake and protruded over the edge. Carrying his load, the man returned to his village. . . . At night, his penis came out of its basket and wandered off in search of women, with whom it copulated. Everyone was very frightened and one Indian, whose daughter had been attacked, mounted guard. When he saw the penis coming into his hut, he cut off the end, which changed into a snake. The man with the long penis died, and the snake became the mother of the termites which can be heard whistling today."[27]

In Hindu myths, men are susceptible to the sexual attacks of beauteously seductive maidens, actually *nāgiṇis* or female cobras masquerading as humans whose true serpent form is manifest only when they fall asleep or wreak vengeance on their enemies. Examples like these underscore caprice and ophidiophobia, but, if to some symbolists women seem more prone to sexual attacks than men, then, surely, female bodily characteristics (vaginal orifice, menstrual blood, childbearing) are a more persuasive explanation than the Freudian psychoanalyst's premise that the serpent is universally a "substitute" penis. Structuralist theorizing of this "universality" is not only complicated by psychoanalysis, but often also founded on the insecure base of culture diffusionism.

Thus La Barre compares the human penis with the cobra, especially its hood, in terms of its "erection," "detumescence," "autonomous will," "ejaculatory behavior," and similar psychoanalytic projections. The serpent, according to him, is "a libidinized symbol of something else," and around it and the phallus many myths are woven whose ultimate center of origin or dissemination is the African continent:[28]

The snake is not a phallus still less can we pretend that the human mind must

everywhere and inevitably discover that they "are" the same. Far more economical of scientific theorizing, therefore, is the acknowledgment that symbolism can be diffused in much the same manner, and indeed in the same historical directions in the Old World, as we can establish that items of material cultures have been diffused. . . . The startling parallels we find between American and Old World snake symbolism may still be arguable in the familiar terms of diffusion versus independent invention that we employ for material culture. If independent invention is the presently preferable assumption, then the similarities may nevertheless be explained in terms of the same body image that is everywhere being projected into nature. In the diffusion [within Africa and western Asia] of the African concept of phallic snake Egypt appears to be the critical region, either as place of origin or as the intercontinental doorway to diffusion from elsewhere, whatever the direction.

One cannot but agree that transmission (or "diffusion") of social attitudes involving animals has gone on constantly since remotest prehistory, as certainly was true during the human migrations from northeastern Siberia to the New World via the Beringia landmass perhaps 40,000 years ago. La Barre, despite speculative claims based on "striking similarities" between New World and Old World phallic-ophidian symbolism, is correct in rejecting explanations based on Jungian "archetypes" and on trans-Atlantic or trans-Pacific culture diffusions in pre-Columbian times. Modern students of ethnology, archaeology, and the laboratory-based sciences such as geology and human blood-group genetics are practically unanimous in denying that there exists in the Americas any evidence of material or conceptual imports from Egypt, the Near East, or India during pre-Columbian times, i.e., until the early sixteenth century, that hints at culture diffusion.[29]

What is questionable, however, are La Barre's psychiatric (or psychoanalytical "oedipal *Homo sapiens*") explanations "in terms of the same [serpent/human] body image that is everywhere being projected into nature," and it is here that he operates on no less questionable assumptions of "striking similarities." Despite his claims, the facts are that genital (or human fertility) significances attached to the serpent are freakish in the Americas (where the emphasis is primarily on its links with moisture and/or the cardinal directions) and that even the traditions and symbols of ancient Egypt (where its link was primarily with cosmic creation, death, and rebirth involving the sun cult) cannot be compared with those of the Hindus.[30] In India, not only are concepts of human fertility (in contrast to the psychoanalyst's overemphasized *genital* interpretation) varied, but also ophiolatry and its iconography are entirely different from the Egyptian.

La Barre is not alone among psychologically oriented anthropologists in perpetuating trite and nonsensical Freudian precepts with respect to phallic symbolism. Gabriella Eichinger Ferro-Luzzi (who does question them minimally) believes that there is a "greater frequency of the phallic association of the snake than its female association the world over" and that this phallic symbolism is "reinforced by the image of snake bite, *suggestive of the perils of sex*" (my italics).[31] Whether or not sexual fantasies impel an individual consciously or unconsciously to make the serpent a symbol of the phallus rather than the vagina is moot. As generalizations universally applicable to entire societies, however, La Barre's and Eichinger Ferro-Luzzi's assertions, like similar ones made by others on the basis of Freudian precepts, strike me as unproductive because they are statistically almost impossible to verify.

SOME PERTINENT ARTISTIC EXPRESSIONS

In cultic art, the serpent's feminine associations are on the whole at least as versatilely represented as the masculine. Crude terracottas like the one in figure 83*a*, from ancient northern India, are propitiatory, votive images, probably of the fertility goddess herself. They simultaneously represent a cobra and a woman, with the "spectacle-pattern" of a cobra's hood corresponding to human breasts and the wide lower portion directly equated with an ample human pelvis. Stylistically, idols like these correspond to terracottas of wide-hipped women—in Indian art a conventional means of indicating fecundity, which these cobra images caricature just as effectively. The serpent is no less evident in a Greek painted terracotta that signifies maternity (fig. 83*b*).[32]

That the ophidian body yields with equal ease to phallic, vaginal, and bisexual artistic treatment is illustrated by four simple examples from a wide range of imaginative objects whose cultic rather than secular erotic significance is apparent from their archaeological contexts (fig. 83*c–f*). Relics like these have a more tangible value from our viewpoint than abstract psychoanalytic speculations concerning their hidden "meanings," for religious texts clearly disclose that in many cultures the genitals symbolize the powerful sexual potency of deities—sometimes male, sometimes female—who preside over childbirth. In some farming societies that make relatively little or no overt use of genital symbols in their iconography, the decor of ceramic vessels frequently suggests the serpent's links with agricultural rather than human fertility rites.

The dominant motif on the pottery of the mid-Jomon period of Neolithic Japan (ca. fourth millennium B.C.) consists of serpents in stark relief. Esaka Teruya, an authority on the ceramics of the period, believes that *all* its clay vessels focus on ophidian decor in one way or another. By contrast, the idols of this and other periods have no genital symbols that suggest the serpent's form. Some of these idols surely presided over agricultural bounty and do carry naturalistic serpent effigies appliqued over the head; a specimen of this type[33] is noteworthy because it resembles the Chinese clay head, of approximately the same epoch, illustrated in figure 49. Since earliest times pottery and the kiln fires "infused" into it have had deep significance in Japanese traditions, which, as we have noted, include ophidian themes in divine contexts. Mid–Jomon-period relics attest to a phallic cult, but the phallus-like objects involved in its rites are quite plain and entirely devoid of serpent symbolism. Thus the model of a coiled serpent on a fragment of the rim of a clay vessel of that period (fig. 83*c*) is enigmatic, since its phallic suggestiveness, though it may seem strong to some, is only presumptive, while the motif on the head may, to others, seem convincingly vaginal.[34]

On the other hand, the phallic associations of the serpent are unquestionable in Celtic art and fortified by our knowledge of human and perhaps also equine phallic rites practiced by the Celts. What this means in terms of formulating generalizations is difficult to say. Throughout their farflung territories in ancient Europe the Celts accorded to the serpent an especially important place in their divine myths, rich art, and extensive legends. The ram-headed serpent appears as early as in proto-Celtic times and is found consistently in later Celtic traditions. It is the attribute, along with the stag, of the god Cernunnos, but he was probably associated with Jupiter, Mercury, or Mars, not with the phallus (fig. 31). Celtic phallic stones with coiled or sinuous serpents carved on them are

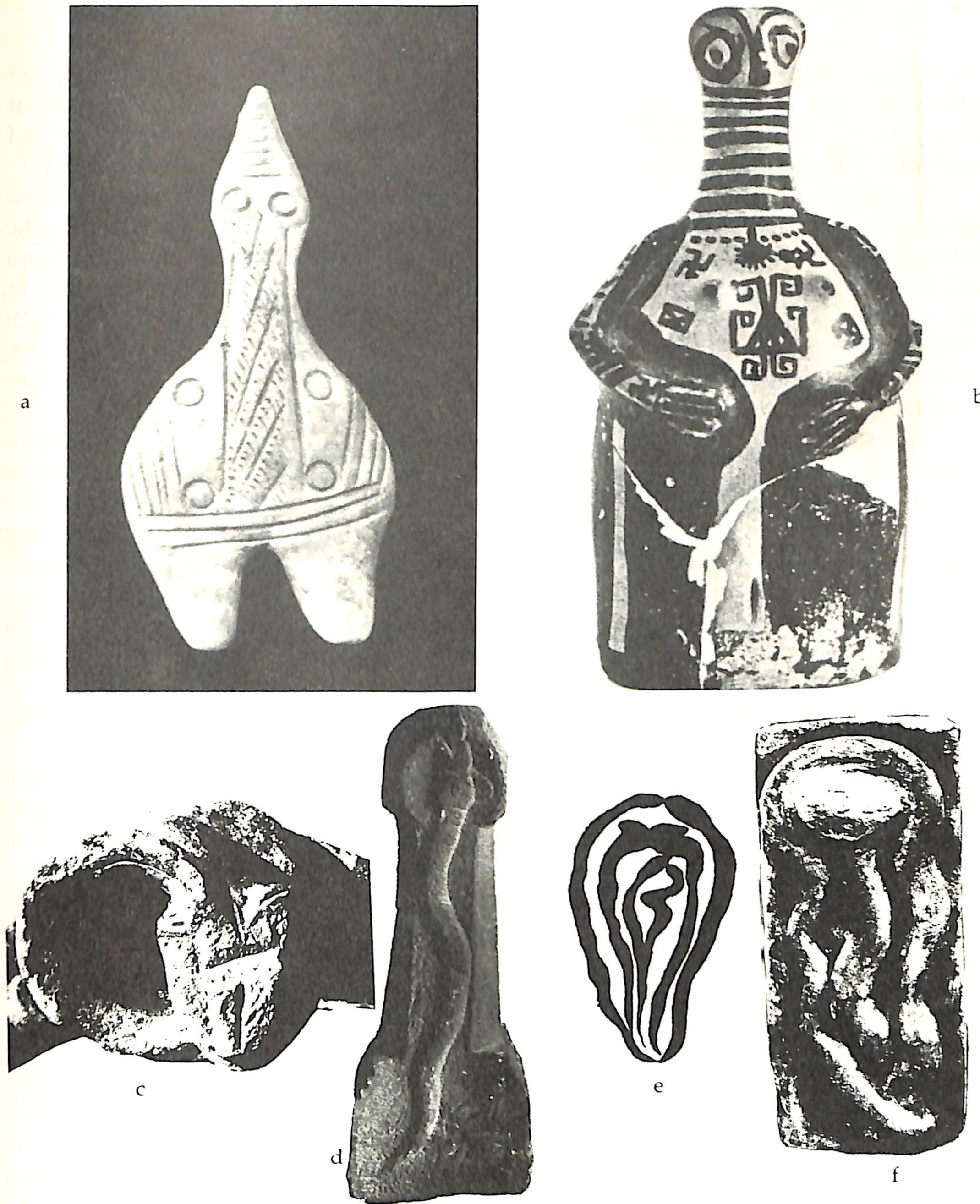


Fig. 83. Serpents as symbols of the genitals and pregnancy: *a*, crude terracotta votive image of a cobra in the form of a wide-hipped, fertile woman, northeastern India; *b*, Greek painted ceramic idol portraying a pregnant woman from a cemetery for children at Kos, eighth century B.C. (the symbolism of the triangular motif on the chest is unclear, but it may simultaneously represent the pubic triangle and an infant, the bifid processes perhaps being ophidian; the notion of rebirth of the dead as serpents was well entrenched in the Hellenic world); *c*, phallic (?) coiled serpent with a head signifying the vagina, from the rim of a pot, Middle Jomon period, mid–third millennium B.C., Japan; *d*, stone with a serpent engraved upon its side, Celtic Britain; *e*, design on a painted pot, third millennium B.C., Elamite Iran, showing three pairs of serpents in "kissing" postures, simultaneously connoting the vagina; *f*, Canaanite cult object in the form of a vagina (plus phallus?) constituted by a serpent, Period of Amenophis III, 1402–1364 B.C., Beth-Shan, Israel.

known in Britain and elsewhere. So, too, are phallus-like heads, which are probably more numerous. To the Celts, the head was a special entity because it was thought to be the seat of the soul. These facts, however, have not led anyone to suggest that the human head, like the serpent, is a phallic symbol.

In addition to the god Cernunnos there were goddesses who had ophidian attributes, for instance the riverine deity (Verbeia?), who appears in the Celtic art of England and France,[35] and even a seemingly bisexual deity. In a stele from southern France, a serpent (highly suggestive of a penis) issues from the crack in an egg (highly suggestive of a vulva) located in the crotch of a personage with female breasts. Despite these bisexual features, this individual is identified—for such is the weight unwittingly given to Freudian precepts—as that of a *male* Celtic divinity ("Dieu androgyne").[36]

In figures 83*e* and *f*, vagina and serpents constitute a conjoint motif with an explicitness that is not always apparent in the immense range of cult objects which employ these components separately as fertility emblems. Whether conjoint or separate, cryptic or explicit, the origins of these emblems of femininity surely lie in dim and distant prehistoric epochs and attest to the force with which the serpent impinged upon superstitions related to such basic human concerns as childbearing, infant mortality, and burial. Throughout early human social history, burials of adults as well as infants in crypts and in dark and forbidding caves are likely to have evoked morbid thoughts of serpents as natives of these repositories and intermediaries involved in, even instruments of, death and rebirth.[37]

Excavations in Bahrain reveal that graves of at least the second millennium B.C. are consistently grouped around an altar thought to be a serpent goddess's. They contain not only human skeletons (many of them children's) buried in large clay pots, but also the skeletons of serpents—thought to be sacrificial—sealed within similar small, tightly lidded pots.[38] The ophiolatrous traditions of this region in the Persian Gulf are archaeologically well attested,[39] and though the burial customs of ancient Bahrain may have been unique, the following descriptions will show how powerfully ophidian symbolism was entrenched in fertility and burial rites in certain other parts of the world.

Images that suggest fertility by emphasizing the genitals are innumerable but often so stylized iconographically that the serpent's role as a *female* deity's alter ego is apt to be overlooked precisely in those cultures on whose behalf Freudian theorists claim its phallic associations. These cultures, typically, are from the Near East, the eastern Mediterranean, and southeastern Europe. Their imagery commonly focused upon a "mother-goddess" who presided over, and granted the boon of, fecundity to her devotees. Her power was symbolized in idols endowed with prominent breasts and genitals. Her postures were inviting, and she was portrayed as pregnant, suckling an infant, or steatopygous (as in figures 14, 15, and 22). The symbolic abstractions of the goddess's maternity-granting power were a triangle—the vaginal or pubic triangle—and, though not always, the serpent, represented naturalistically or by zigzags, sinusoidal lines, or chevrons. Thus her symbols are often cryptic but easily deciphered if one sees them in the broader context of a culture's ophidian traditions.

The pubic triangle was variously depicted. It might be filled with decorative detail, show only a simple bisecting line or depression indicating the vulva, or even be abbreviated artistically as a V. It was sometimes casually represented,



Fig. 84. Iberian idols and amuletic plaques: *a*, ochre-painted human bone of an "eye"-goddess with a casually oriented pubic triangle, Late Eneolithic, southern Spain; *b*, *c*, and *d*, cylindrical marble or calcareous stone idols with parallel incisions beneath eyes, combined, in some specimens, with the hair and flowing tresses of a woman; *e–g*, flat pottery amulets from various parts of southern Spain and Portugal, with holes for suspension and parallel lines *(e)* or zigzags *(f* and *g)*. The relationship of these and similar objects to ophiolatry is indistinct, though petroglyphs (see fig. 6*d-f*) hinting at a solar-ophidian cult are known in Iberia.

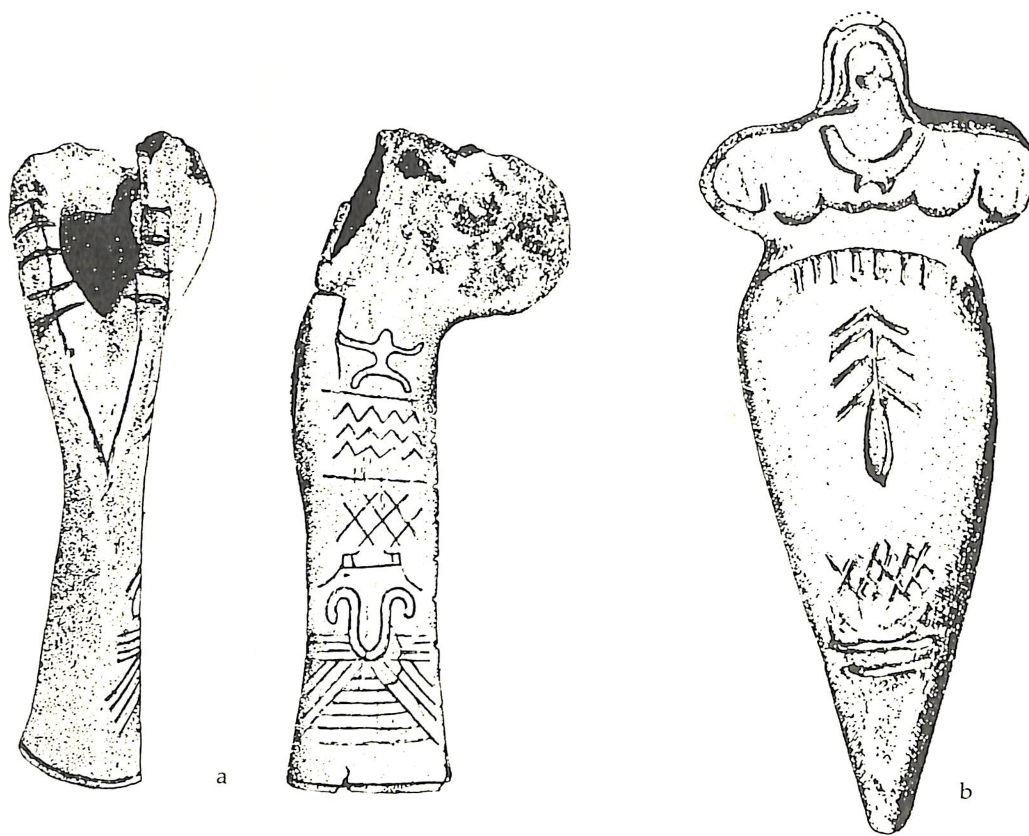


Fig. 85. Incised bones, Neolithic, Gaban, near Trento, Italy, showing fertility but not ophidian symbolism. They are, however, to be viewed, according to their discoverer, as part of the larger framework of East-Central and Balkan Neolithic cultural traditions, which do include ophidian-fertility relics.

with the apex pointing upward, or located with little regard to other parts of the human body. The inverted pubic triangle on an ochre-painted bone of the "advanced Eneolithic" period of southern Spain (fig. 84*a*) is recognizable largely because of the eyes above it and because it is correctly oriented in other specimens. Sometimes, zigzags replace the triangle. The significance of finds like these would be obscure without reference to large numbers of cylindrical baetyls showing a noseless, mouthless, sometimes long-haired personage, to clay plaques and bowls, and to rock engravings with clear serpent representations, some including solar motifs that resemble the eyes so starkly stressed in many of the cylindrical baetyls. The likelihood that baetyls of the kind seen in figure 84*b* belong to an ophiolatrous cult—indeed, represent an ophidian goddess—is presumptive but nonetheless intriguing.[40]

In another remarkable bone from the Neolithic of northeastern Italy (fig. 85*a*), suggestions of maternity are conveyed by a human figure, perhaps an infant's, incised on it. Below the figure are three zigzag lines whose ophidian symbolism is conjectural, for I am unaware of clear serpent representations that confirm it. Pointing towards the inverted pubic triangle at the base of the bone is what appears to be a symbolic representation of a phallus and testicles. Whether

or not its primitive makers saw a direct biological connection between copulation and eventual childbirth is moot, but, in any case, the pubic triangle on this bone clearly corresponds to the genital region indicated on a companion, feminine figurine from the same locality.[41]

In Libyan rock formations, engravings of female figures in "erotic" postures incorporate small natural clefts as representations of the vulva.[42] Prehistorically they may have had cultic significance, but their link with any ophiolatrous culture is conjectural—though it is of interest that the Egyptian serpent goddess Mertseger is said to have had Libyan forebears.[43]

The serpent and the pubic triangle as joint symbols are best exemplified—sometimes unambiguously, sometimes abstrusely—in objects of the Neolithic and Chalcolithic periods of the Near East and eastern Europe (including the Aegean), but their conceptual origins may be far older than is evident from cultic art. Culture diffusion between these regions as a factor in the spread of these motifs prior to the first millennium B.C. seems remote, since the human emotion vented through these simple conjoint motifs is a rudimentary one of abhorrence of the serpent and the artistic expressions are distinct enough to have been conceived indigenously far earlier. These joint symbols, in any event, are absent in China—whose Neolithic painted pottery patterns are alleged in the older literature to be derived from those of the Near Eastern and/or eastern European cultures. The Near Eastern civilizations provide the most illuminating evidences of these symbols of childbirth.

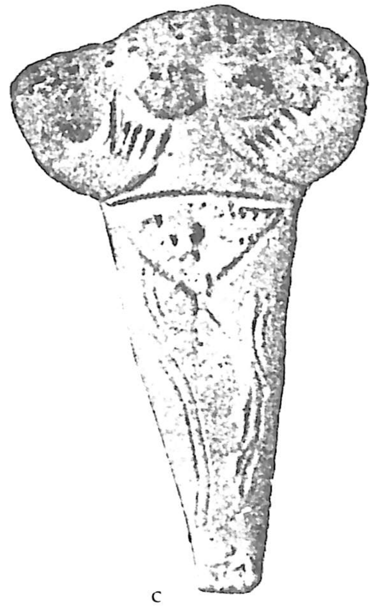
In Sumerian cuneiform texts the word *muš-sătur*, "womb-serpent," has the specific connotation of a venomous species as contrasted with the imaginary attributes of the dragon *muš-huš* common in Mesopotamian art.[44] The underlying sentiments of terror of this "womb-serpent" and veneration of the goddess of childbirth, Nintu (or Ninmaḫ), "the mother goddess," "mother of all living creatures," are evident in a temple hymn. It concerns one of the oldest Sumerian settlements, Kesh, where the cult of this goddess seems to have prevailed even in the protoliterate period: "Mighty Kesh . . . causes terror to reign like a large womb-serpent."[45] Another text, in a reference to birth deformities, speaks of demons "coiled up . . . like a serpent in the human womb," and another says "May the tooth-edged arrow be to all it strikes a womb-serpent."[46]

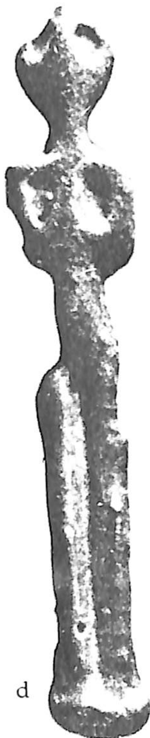
Whether Nintu was primevally conceived as serpent-bodied is unknown. Nor are her ophidian attributes ever evident in Sumerian art, though, in the art of later Semitic religions, indubitably ophidian mother-goddesses were but variants of another Sumerian human fertility deity, Inanna. It is noteworthy, however, that the Sumerians conceived Nintu as a woman from whose left and right shoulders emerge two fetal heads[47] just like the serpents that characterize Ningishzida, god of agricultural fertility. A creation myth that focuses upon Nintu's role mentions how she creates deformed and inferior types of man, and in addition there is a sinister if unclear remark by a god that "the creature whose name you uttered, it exists . . . the goddesses of birth will stand by at your fashioning. . . . Ninmaḫ (Nintu) will bind upon it the image (?) of the gods, it is man."[48]

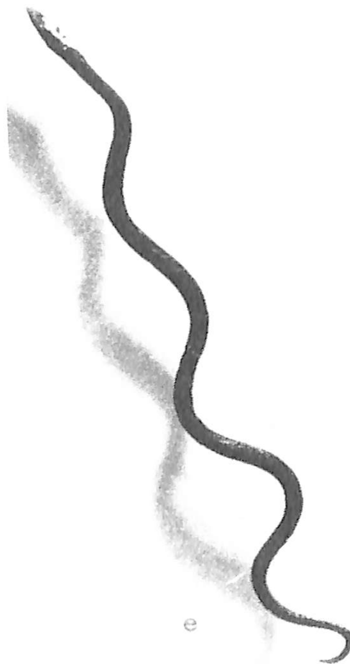
What that creature is, we do not know, and to identify Sumerian clay idols like those in figure 86 with any particular deity would be rash. Nevertheless, they strike me as undeserving of the reticence contained in the terms generally applied to them by archaeologists—"human figurines" or, at best, "reptilian" or


a


b


c


d


e


f

"lizard-like," when, in fact, lizards are obscure in Mesopotamian traditions. Sir Leonard Woolley, who first excavated specimens of this type, almost every one of them female (fig. 86*a*), describes them lucidly in other respects:[49]

> that they do possess a religious significance is evident from the fact that they were placed in graves . . . [and since no other objects were found with them] they must be votive and therefore had some magical or religious value . . . only the female figurines, in which the reptilian character is more strongly marked, have hitherto been found in graves and in one instance only was the figure of a non-reptilian type. The association of the figures with the dead and the fact that they normally present features emblematic of the gods of the Underworld support the view that they are chthonic deities. . . . They are always represented as nude . . . some hold an infant to the breast. The bodies are slender to the point of exaggeration and well modelled . . . the pudenda conventionally emphasized. . . . To the bodies, which are by no means unpleasing, the heads are in striking contrast. The top of the skull rises in an elongated dome [formed of] bitumen to represent hair . . . the head, unduly large, is absolutely reptilian in character coming forward to a blunt snout, flat above, with great slit-like eyes which are set at a sharp slant; the nostrils are mere holes at either side of the snout and there are no ears. . . . I am convinced that the artist who could so well model the human body could have made a far better success of the human face, had he wished to do so, than appears from these lizard-like grotesques.

The exceptional one or two known male figurines (fig. 86*b*) of this type only reinforce one's doubts about the reliability of Freudian assertions about the predominantly male associations of ophidian symbols (a view that Woolley, of course, was unconcerned about).

Figures 86*c*, *d* and *f* represent two goddesses identified with the archetypal Sumerian Inanna: the Assyrio-Babylonian Ishtar and the West Semitic Astarte, etymologically identical with Ishtar. All three were goddesses of sexual love and fertility and had the serpent as one of their most significant attributes. Ishtar *(c)* is here portrayed naked and offering her breasts. Her vagina is marked by a large triangle towards which creep, one on each thigh, two serpents represented by incisions in the clay. Crude terracotta images of this kind—the common person's votive offering to Ishtar at her temple at Assur, In Assyria, and elsewhere—are numerous and eloquently express the devotee's desire to be fecund.[50] Artistic variations of this theme are many and easily evade recognition, especially when they are ornate. Thus the middle of the flounced skirt

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Fig. 86. Ophidian fertility cult images: *a* and *b*, terracotta figurines of the al-'Ubaid period, fourth millennium B.C.; *c*, crude terracotta votive image of a female offering her breasts, Temple of Ishtar, Assur, Assyria, showing sinuous incisions on the legs and thighs representing serpents creeping towards the prominent pubic triangle; *d*, tiny (53 millimeters high) silver image of the goddess Ashtoreth, the only idol found beneath the lowest part of a Canaanite temple at Nahariyeh, Israel, showing general ophidian suggestiveness and serpent-like ridges on the legs; *e*, finely wrought copper serpent with gilded head, Medianite period, twelfth century B.C., the only votive object found in the naos, Hathor Temple, Timna, Israel; *f*, gold pendant, repoussé, 1450–1365 B.C., Ras Shamra, Ugarit, showing the naked fertility goddess with her emblems—a lion, antelopes, and a pair of serpents crossed at the level of the pubic triangle—against a starry sky background.

worn by the bare-breasted goddess may have a band of zigzags that stands out conspicuously from the rest of the pattern.[51]

In many images of Astarte, the orientation of a serpent relative to her pubes leaves little to be imagined (fig. 86*f*).[52] A slim-bodied silver figurine of Astarte (fig. 86*d*) has a head strikingly like a serpent's, large sockets in place of eyes, no nose, and a completely nonhuman visage. Less than 1 centimeter in width and only 5.3 centimeters tall, the body, nevertheless, is almost human. Hands seemingly are joined by their palms (or she is armless and the breasts are hollowed out). A gentle ridge on each leg up to the knee corresponds to the incisions on the legs of the clay figure of Ishtar just described. This silver image is of special interest because it was found beneath the lowest floor of a Canaanite temple dedicated to Astarte, which speaks for its chthonic, ophidian identity all the more. Horned altars were part of the cult. Built of ashlar masonry, these otherwise bare altars sometimes had their lowest blocks engraved with the figure of a twisting serpent.[53] Lifelike effigies of copper or bronze serpents (including one with a gilded head) found in Israel are considered very significant. They are generally small, from 12 to 20 centimeters in length, but "they provide the only clue to the rites of the temple" and, like the silver figurine of Astarte, were excavated from the most important parts of the temples.[54] The effigies sometimes occurred in pairs, as in the "holy of holies"—the Area H temple at Hazor. In the Canaanite temples at Beth-Shan, a serpent-cult center of great importance, the deity assumed fully ophidian form. One of the idols even has human breasts with a cup beneath to catch their milk.[55]

Solomon is said to have built a temple to Astarte (the Biblical Ashtoreth) which lasted until the reign of King Josiah, and despite official rejection of earlier polytheistic beliefs the Israelites are mentioned in the Old Testament (2 Kings 23:13) as having "backslid" to "the mount of corruption which Solomon the King of Israel had builded to Ashtoreth the abomination of the Zidonians." That many of the beliefs anciently fostered in the western Semitic religions arose from traditions that were originally Sumerian is well known, but it is hardly likely that sentiments linking fertility and the cult of the serpent could have been so obstinately rooted were their ritual expressions not indigenous throughout the area millennia before recorded history.

The purpose of the baked clay object in figure 87*a* is not clear, but it seems to be a miniature, portable shrine. Shaped like a lidless box, it has a pair of entwined serpents in appliqué all around its outer sides except at the rear. Three sinuous serpents are disposed in parallel on its floor, their heads resting on inclined planes set before a stepped chair or throne whose back is now damaged. An idol may have been placed on it or perhaps envisioned as seated on it, but it is uncertain whether the deity was male or female. The three sinuous serpents seem to represent his or her numinous attributes. It may have been the god Dumuzi, one of whose epithets was Ama-ushum-gal-anna, "the mother is the great serpent of heaven,"[56] or, more likely, his consort Inanna or her Assyrio-Babylonian equivalent Ishtar, the best-known of the goddesses of love and fertility, or perhaps Nintu. That this shrine may have represented a fertility cult is suggested by two simple terracotta models of votive thrones or chairs epitomizing femininity through the motif of the pubic triangle. The zigzags inside them strike me as more than decorative devices (fig. 87*b*, *c*). The front legs of one of these chairs are simultaneously the deity's. In the other, a flat plaque,



Fig. 87. The pubic triangle and the serpent: *a*, clay object, probably a portable shrine, Babylonian, ca. 2700 B.C., with three serpent figures aligned before the fertility goddess's stepped throne; *b* and *c*, votive clay thrones representing the seated goddess, Third Dynasty of Ur, 2300–2200 B.C.; her pregnant condition is obvious in *b*. Whether the incised patterns within the vagina in both *b* and *c* are ophidian symbols is conjectural though they may well be more than decorative; *d*, Philistinian painted clay throne, early twelfth century B.C., Ashdod, Israel, with diminutive breasts indicated on the back, which is continuous with the goddess's elongated neck, and vestiges of triangles painted in the position of the "crotch," where seat and back meet.

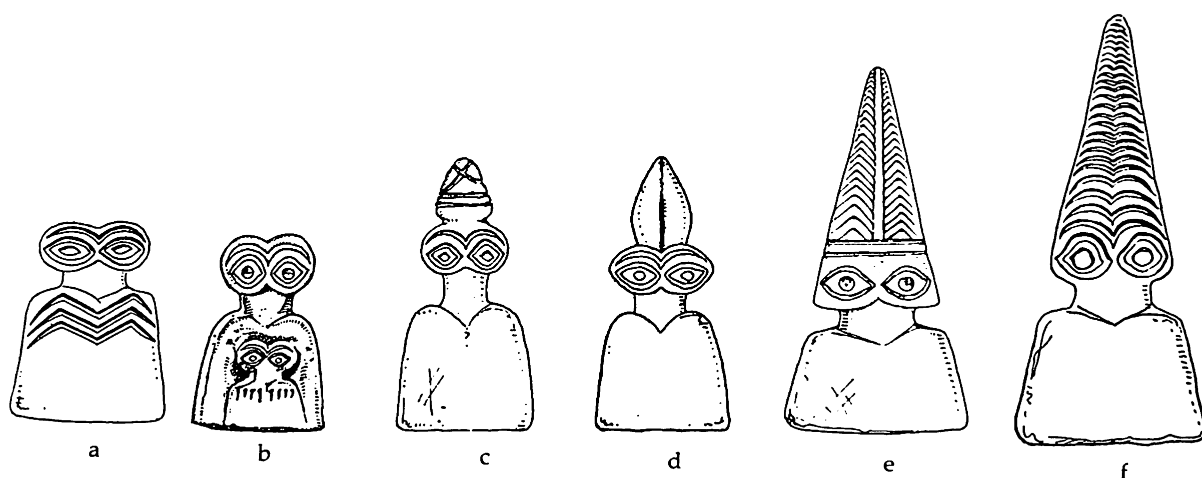


Fig. 88. Images of the "eye"-goddess, Ninevite period, early third millennium B.C., Tell Brak, Syria.

the artist portrays the deity in low relief, her hands imaginatively positioned so as to outline the pubic triangle, the pregnant abdomen above it intentionally reduced in scale (to produce the effect of head and torso) while the subtle modeling of the legs completes the image. The miniature clay chair from Ashdod, Israel (fig. 87*d*)[57] is a Philistinian representation of the deity of fertility. Four painted triangles, now badly faded, indicate her pubes and are logically placed in the bend formed by the seat and the back. Open breasts enhance her nudity, and the long neck terminating in a markedly nonhuman head and visage, though somewhat damaged, strongly hints that she was conceived as ophidian.

Cultic representational art by and large is characterized, perhaps everywhere, by an imagery rich in cryptic, even "bizarre" variations that are often described guardedly even though the elementary form of their progenitor is an unambiguous symbol. Now, cautiousness is proper when a discovery is new or a wider perspective is lacking, but interpretations made inhibitedly often outlive their usefulness and detract from the contribution specific objects can make towards elucidating the symbolism implicit in them. The cases in point are many.

Thousands of images of the type shown in figure 88 have been excavated intact from Tell Brak, a northern Mesopotamian settlement at the junction of several intercontinental travel routes in antiquity. They portray a goddess whose cult and temples are also represented in other parts of Mesopotamia by similar images. All are flat and have aptly been called eye symbols, as the simplest of them—in clay, slate, steatite, or alabaster—clearly warrant, for large penetrating eyes as a symbol of fearful divine power are conventional in Mesopotamian art. Some of the idols have bead necklaces clearly indicated at the base of the neck. Others (fig. 88*a*) have incised upon the rectangular "torso" zigzags which, to some, are folds of upper garments—an unlikely interpretation because votive fertility figurines of the period were conventionally portrayed naked and nudity was customary among devotees at the shrines of fertility goddesses. An infant (sometimes twins) may be portrayed in place of the zigzags (fig. 88*b*). That these

two symbols are related and jointly as well as separately emblematize the involvement of an ophidian deity of childbirth is, in my opinion, a more likely explanation. The precise identity of the "eye" deity is no better known than that of the starkly ophidian idol in figure 86*a*, though some have suggested that the former is Ishtar.[58]

The heads of the Tell Brak idols often show projections that some identify as "caps" or "hats."[59] The idol in figure 88*c* has a somewhat leaner and longer neck than most, and the phallic nature of its "hat" is borne out, both at Tell Brak and at Ur, by statuettes with distinctly phallus-shaped human heads.[60] The overwhelming majority, however, betray a clearly vaginal significance (clearest in fig. 88*d*), the ornate "hats" of *e* and *f* reflecting no more than artistic license in portraying female sexuality by positioning the pubic triangle as unconventionally as in the ochre-painted bone from Spain already described.

The heavy strip of paint and the sinuous lines forming a V around it represent the vulva and serpents, respectively, in a sherd from Sumeria (fig. 89*a*). This simple pattern is clearly recognizable in view of the foregoing examples, but many other abstract variants of it are likely to be overlooked if one regards them casually. Mechanical repetition of artistically simplified, or elaborate, or disjoined elements often obscures their importance in common pottery to the extent that they are blandly categorized as mere "decorations." Omitting complex cases, a few patterns from an immense pool of painted or incised pottery are exemplified in figures 89*b*–*g*. Even experienced and perceptive catalogers are sometimes remiss in their evaluations of symbolic patterns. For instance, J. Garstang, describing his extensive finds at Jericho, overlooks the importance of the profusion of triangular motifs (fig. 89*c*), though he asserts that "the snake is the only cult emblem appearing among Middle Bronze Age [ca. 1700 B.C.] deposits" and that naturalistic molded serpent effigies on the handles and sides of jugs gave way "in the course of time [to] a wavy line between two straight lines which presumably represents its hole or cage."[61] Contrarily, C. Epstein describes Palestinian painted pottery of the sixteenth century B.C. with little attention to symbolism yet regards it as unlikely that wavy lines were originally intended to represent any specific objects.[62]

The paraphernalia of the cult of fertility included more than idols and vessels. A wide range of objects, such as seals, censers, portable shrines, altars, models of "fertility beds," and plaques, carried the theme of serpent and pubic triangle in abstract ways. Only two specimens from the group in figure 90 need be commented upon: An archaic stamp seal *(c)* from Elamite western Iran (which had strong cultural affinities with Mesopotamia) comprises not only chevrons, but also a zigzag line that winds between triangles above a portal—a theme one can view in two ways. It may signify a "womb-serpent," which, as I have pointed out, was conceptualized as the fearsome guardian of cities dedicated to ophidian deities such as Ishtar or Kadi and placed over doorknobs or above portals. Alternatively, the triangles and zigzags may symbolize a fertility deity in the same way that the small votive object *(d)* from Assyria symbolized Ishtar as high priestess of carnal love. Eunuchs and hierodules, as members of temples to Inanna and Ishtar, engaged in ritual prostitution bearing formal titles such as *nadītu* ("infertile"), *kulmasītu* or *harimtu* ("consecrated"), and *istarītu* ("one belonging to Ishtar"), which also have western Semitic variants. Naked and sometimes castrated priests *(kurgarū)* conducted the rites.[63] Terracotta altars in the



Fig. 89. Pubic triangle and serpent on painted pottery: *a*, sherd from Ur, Third Dynasty, ca. 2700 B.C.; *b* and *c*, pots from the palace storeroom at Jericho, ca. 1700 B.C.; *d*, *e*, and *f*, designs on Elamite pottery, third millennium B.C., western Iran; *g*, Canaanite jug, Early Bronze II, 2900–2650 B.C., found in the royal tombs at Abusir, Egypt.

shape of houses, offered to Ishtar when beseeching fertility, were part of the cult. Most were two-storied, with rectangular doors and triangular windows. They were normally empty, yet pregnant with meaning. Each represented the house of Ishtar or, rather, her brothel, since in her role as universal lover and progenitor she was the archetypal harlot. In Assyria and Babylonia she was called Kilili, and the epithets Kilili musirtu, "Kilili who leans [peeps] out," and Kilili sa apāti, "Kilili of the windows," aptly call attention to the characteristic stations used by her profession for enticing men passing by and filling them with lust. Thus the triangular windows are hardly coincidental, and the serpents that wind amidst them, along with Ishtar's other insignia—tiny doves affixed to the eaves—complete the symbolism.[64]

The cult of Kilili, or Ishtar the harlot, is believed by some to have spread

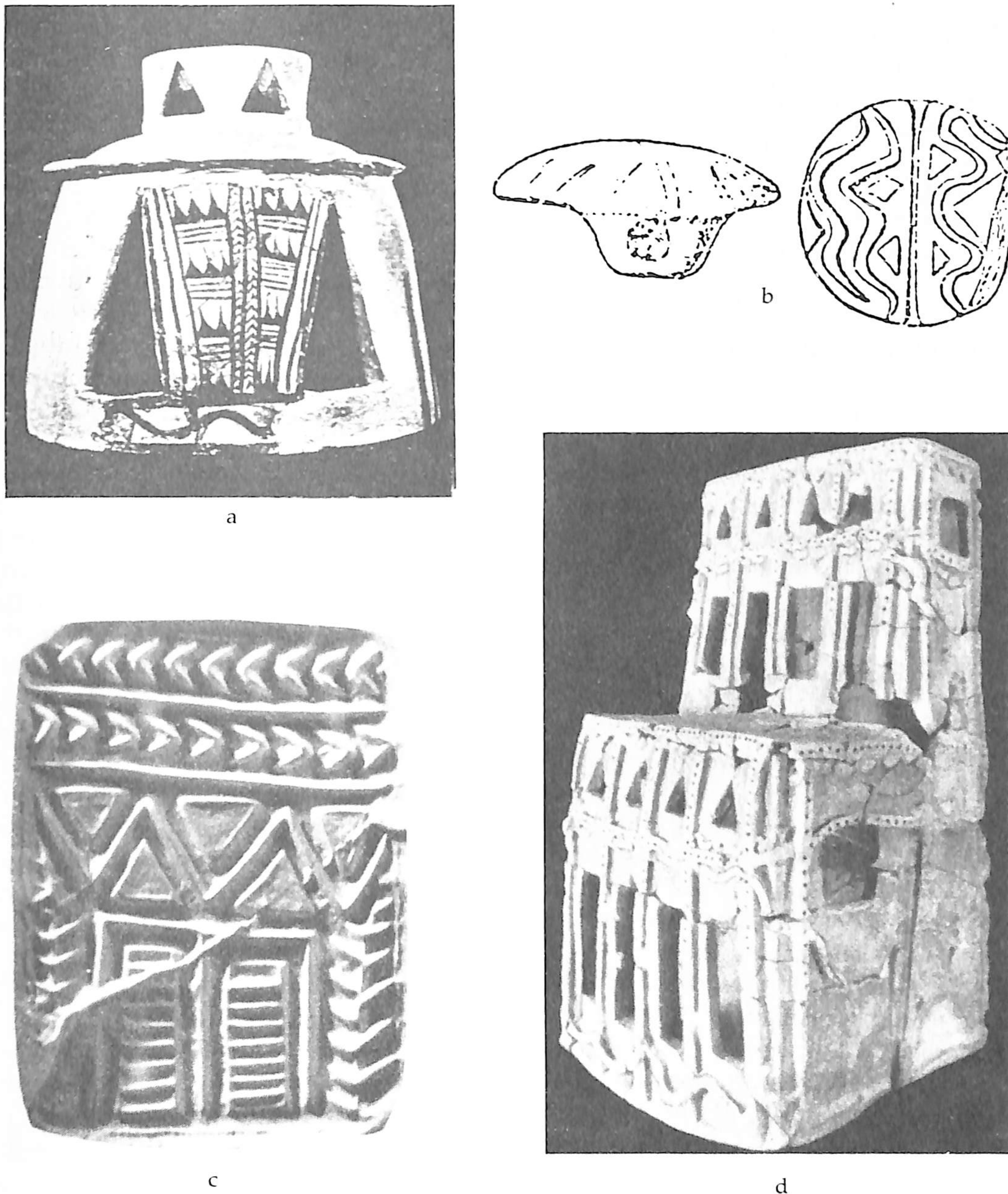


Fig. 90. Pubic triangle and serpent emblems on miscellaneous objects: *a*, incense burner (restored), al-'Ubaid period, fourth millennium B.C., Abu Sharain, Mesopotamia; *b*, archaic button stamp seal of uncertain date, from northern Iran; *c*, stamp seal, Susa I period, fourth millennium B.C., western Iran; *d*, votive clay house with Ishtar's emblems, serpents and doves, near its triangular windows, early second millennium B.C., Temple of Ishtar, Assur, Assyria.

westward from Mesopotamia, via Syria and Phoenicia, to Cyprus. Here, as Aphrodite Parakyptousa or Aphrodite Porne, she personified fertility in her role of patroness of lewd love. Phoenician penetration of Cyprus, however, occurred not much earlier than 800 B.C. Proponents of the view that Aphrodite's presence in Cyprus antedates the Phoenicians' point to the many Anatolian rather than

Semitic features of her cult. In any case, crude, votive, naked terracotta figurines with or without infants in their arms are known in large numbers from Enkomi, eastern Cyprus.[65] It is improbable that they are local versions of the Phoenician, Canaanite, or Mesopotamian models, for they are dated to 1200–1100 B.C. Their pubes are indicated by extraordinarily large, incised triangles, but they have no overt associations with a serpent as in the Canaanite images of Astarte, though the animal was well entrenched in cult observances in Cyprus at least three millennia earlier.

Thus, even when human migrations are well attested, culture diffusion does not always reliably explain superficial resemblances or differences in a religious symbol shared by ethnically disparate peoples. The uncertainties, worldwide, are far more acute with respect to remote prehistory. Because simple forms like the serpent and human genitals can so easily be translated into imitative graphic symbols that express human sensitivities deeply rooted cross-culturally, independent invention of art motifs involving these forms seems to me generally more likely than borrowing from another culture.

Artistically, the symbols of fertility in the relatively isolated maritime regions of the eastern Mediterranean may have had complex origins and are in some ways distinct from those of the Near East. There are no religious texts comparable in age, clarity, and abundance with those of Mesopotamia and its cultural dependencies to permit more than a superficial characterization of the earliest icons, or deities, or a developing pantheon. Nude figurines in which the pubic triangle is clearly linked with the serpent are not common, and it is generally harder to relate them clearly to the earlier phases in the development of a pantheon. The spread of the earliest primitive societies across the sea, their insular religious evolution, and the diffusion of their crafts once these societies differentiated to higher levels involve complex chronologies and culture sequences. Anatolian, Syro-Cilician, and North African culture elements have variously been invoked in explaining the material products of the earliest known Aegean and Cypriot cultures.[66]

In Cyprus, the symbols of a serpent cult occur in burials that attest to sacrificial infanticide. At the earliest known site, at Khirokitia (5800–5250 B.C.), described by Porphyrios Dikaios, the oldest level of a multistoried circular house had an altar with seats and special stones near it. On it was the skeleton of an adult, surrounded by skeletons of infants. There was also a head of "an idol . . . of a male person. On [its] back appear several snakes in relief, the heads of which, had they been preserved, would be placed on top of this idol's head." Dikaios uses these finds and the circular precincts to illuminate cult observances on the basis of immense quantities of mortuary ceramics excavated elsewhere in Cyprus. One of the most important, from the necropolis at Vounous (ca. 2200 B.C.), is a miniature circular model of a sacred, walled enclosure, open to the sky, with a group of human figures representing what is obviously a ceremony involving the bull and the serpent. In this model, three individuals face the entrance, serpents hanging from their arms. Behind them is a bas-relief depicting personages with bull's heads, who also hold serpents.[67] The red polished pottery of Vounous is noteworthy for its serpent (also bull and stag) motifs rendered naturalistically and as sinuosities, zigzags, and stacked chevrons.[68] Many vessels (pyxides) bear effigies of humans coupled on a bed. In one pyxis, chevrons are incised on their necks and on the woman's forehead. In another,



a b

Fig. 91. Red polished ceramic images from the tombs at Vounous, Bronze Age, ca. 2300 B.C., Cyprus. The idol *a* may have served as a feeding station for serpents. Note the elongated necks of both idols and the long tongue with stylized double tips hanging from the mouth of idol *b*.

the lid bears a large central zigzag, at one end of which stands the figure of a man and at the other the figure of a woman holding an infant. In still another, the lid has two long rows of stacked chevrons and five parallel zigzag lines. Others, of more complex shape, have attached bowls which *may* have been feeding stations for serpents (a "snake-house" in clay is described in detail from Bronze Age Enkomi).[69] Among the most pertinent of the finds at Vounous are the flat armless idols of clay with semihuman faces, long necks, and occasionally long tongues. Many have orifices in the body, apparently indicating the vagina. One of these idols bears a pair of small legs, presumably indicating a fetus emerging from the vulva (fig. 91).[70]

The earliest known idols and pottery of Crete and Greece, like those of Cyprus, project sexuality and childbirth through fertility figurines that are stylistically quite distinct from those of the Near East.[71] So, also, do those of the Early and Middle Neolithic cultures of Hungary and Rumania—the Körös (Starčevo-Criş), the Alföld Linear Pottery culture, the Vinča, the pre-Cucuteni, and

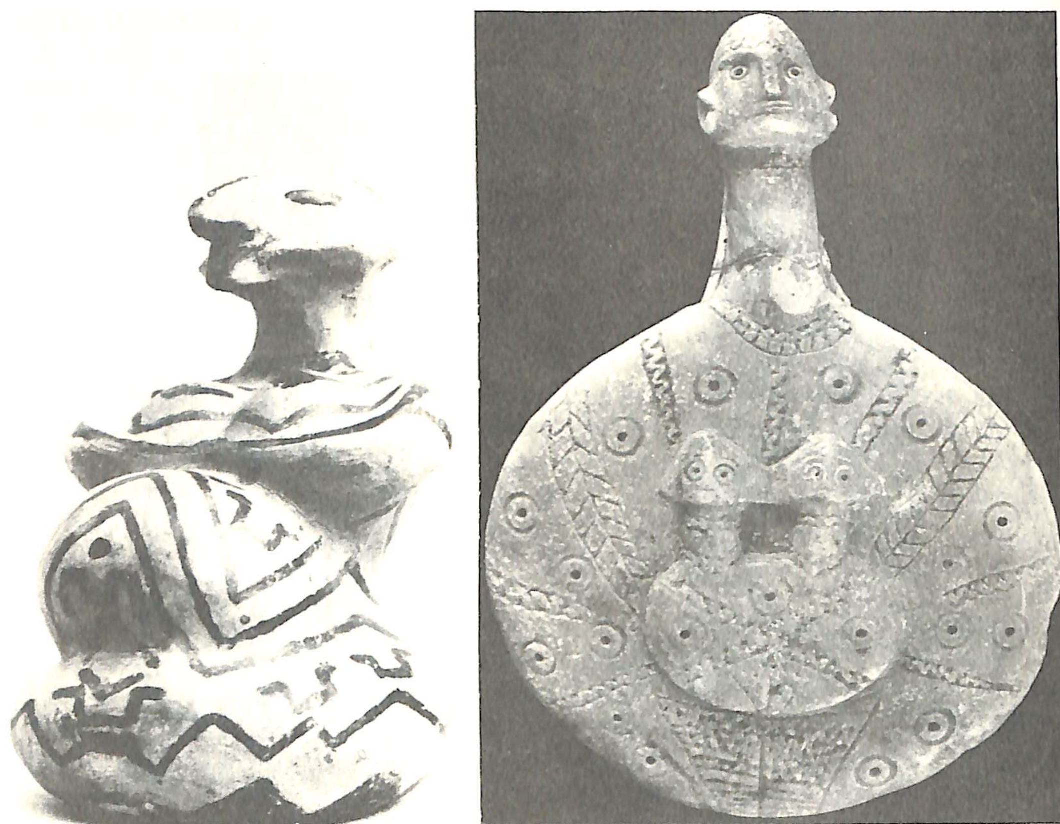


Fig. 92. Anatolian images: *a*, painted ceramic image of a seated pregnant woman, Neolithic (probably Hacilar), ca. 5500 B.C., with diminutive breasts and various patterns on the abdomen, crotch, and hips; *b*, alabaster idol, ca. 2000 B.C., Kültepe, central Turkey, showing pudenda and shape of the heads of the two infants at the center of the disc.

other cultures of eastern trans-Danubian and Carpathian regions ca. 5500–2800 B.C.—that came from the south and bred sheep and goats of Mediterranean origin[72] but emphasized their fertility cult and ophidian symbols in unique styles allied to those of northern Greece. Thus, mindful of the idiosyncrasies of graphic and sculptural symbolic representations, it is best that we subordinate but not ignore the question of human migrations of the period when considering some of the relics of these areas.

That the painted ceramic idol in figure 92*a*, from Anatolia, emblematizes fertility is self-evident, but its animal symbolism, if any, is enigmatic in view of the differences between the art of prehistoric Anatolia and the Hellenic world, on the one hand, and the Near East and Anatolia, on the other. With zigzags, a pubic V, and a sign resembling a human form painted on the abdomen (the navel representing its head?), it is in the style of Hacilar, one of the earliest sites in southwestern Anatolia, and is datable to perhaps 5500 B.C. One can only be subjective when describing its visage, which in André Parrot's words "is not, in any way, that of a woman, but of an animal very difficult to identify. One may

suggest perhaps a goat, whose [head] is painted in the front. . . . the mouth [is] open, the tongue pendant. . . . This strange creature is devoid of all explanation."[73] Almost certainly, it pre-dates any Hellenic, Assyrian or other Semitic religious influences in these regions.[74] However, its ophidian attributes, if any, are uncertain despite the zigzags and the hanging tongue, since the archaeological relics of early Anatolia are quite poor in evidences of a serpent cult.

Disc-shaped alabaster idols (fig. 92*b*) from Karum Kanesh (modern Kültepe) in Central Anatolia are of a different class. Dated to the end of the third millennium B.C., they are from a site in Hittite territory where an Assyrian trading center established in about 1850 or 1770 B.C. is attested by Assyrian inscriptions excavated from the lowest strata. The Assyrians "were a foreign element in Asia Minor and have exercised almost no influence on Anatolian culture, but furnish us with valuable chronologically classified material on the culture of the epoch."[75] However, the Hittites are known to have adopted many of the gods and religious beliefs of their precursors, the Hattians, the indigenous people of Central and South Anatolia conquered by them in about 2000 B.C. Thus these disc idols appear to be the products of, or inspired by, an indigenous Central Anatolian pre-Hittite people. Any suspicion that they are related to Tell Brak idols (like the one in figure 88*b*) or were inspired by the cult of Ishtar seems groundless, since a form of her cult was adopted in Anatolia only in about 1380 B.C.[76] *If* one suspects any ophidian identity in the disc idols, therefore, it can hardly be based on the prominent pubic triangle, the cult of Ishtar, or superficial resemblance to the Tell Brak idols, but must derive from the long slender necks and the noseless, mouthless faces and triangular heads (resembling a viper's) portrayed in many of them. The small circles and other symbols on the discs may have had an astronomical significance. The art of the Hittites and their precursors, the Hattians, is not rich in ophidian themes, but there was an important place in their myths for a moon god, a "monster dragon" Illujanka (clearly represented in a famous frieze as a sinuous serpent), and a weather god who eventually annihilates it.[77]

The Kültepe disc idols share no more than their roundness with ritual pottery objects from the Hellenic world known as "frying pans," which are almost exclusively confined to the Cyclades and with which they probably have no stylistic connections at all. Tiny solid triangles stamped into the clay are part of the design of solar and ship symbols that decorates them, but the chief element in every specimen is a pubic triangle or V incised just above the short stubby "handles," which are seemingly meant to indicate legs (fig. 93). These pubic triangles are in many cases surrounded by zigzags, whose ophidian symbolism in Hellenic art in general is fairly sure and which, in addition, reflect religious traditions some of whose clearest manifestations occur in Crete.

The bare-breasted "snake-goddesses" of Crete are famous (fig. 94*a*). Most of these are faience figurines of the Palatial, Middle Minoan III period (1750–1580 B.C.). Their colorful flounced skirts, headgear, ample bosoms, and serpents twisting about their arms and torsos have popularized awareness of the cult more effectively than any other Cretan relic. It is doubtful that Anatolian, Syrian, and Egyptian immigrants influenced the religious art of Bronze Age Crete (ca. 2500–1200 B.C.) in any significant way, since attempts at deciphering Cretan scripts (Linear A and B) reveal no convincing evidences of Afro-Asian linguistic admixture but only show that the Cretan dialect was an early form of Greek.

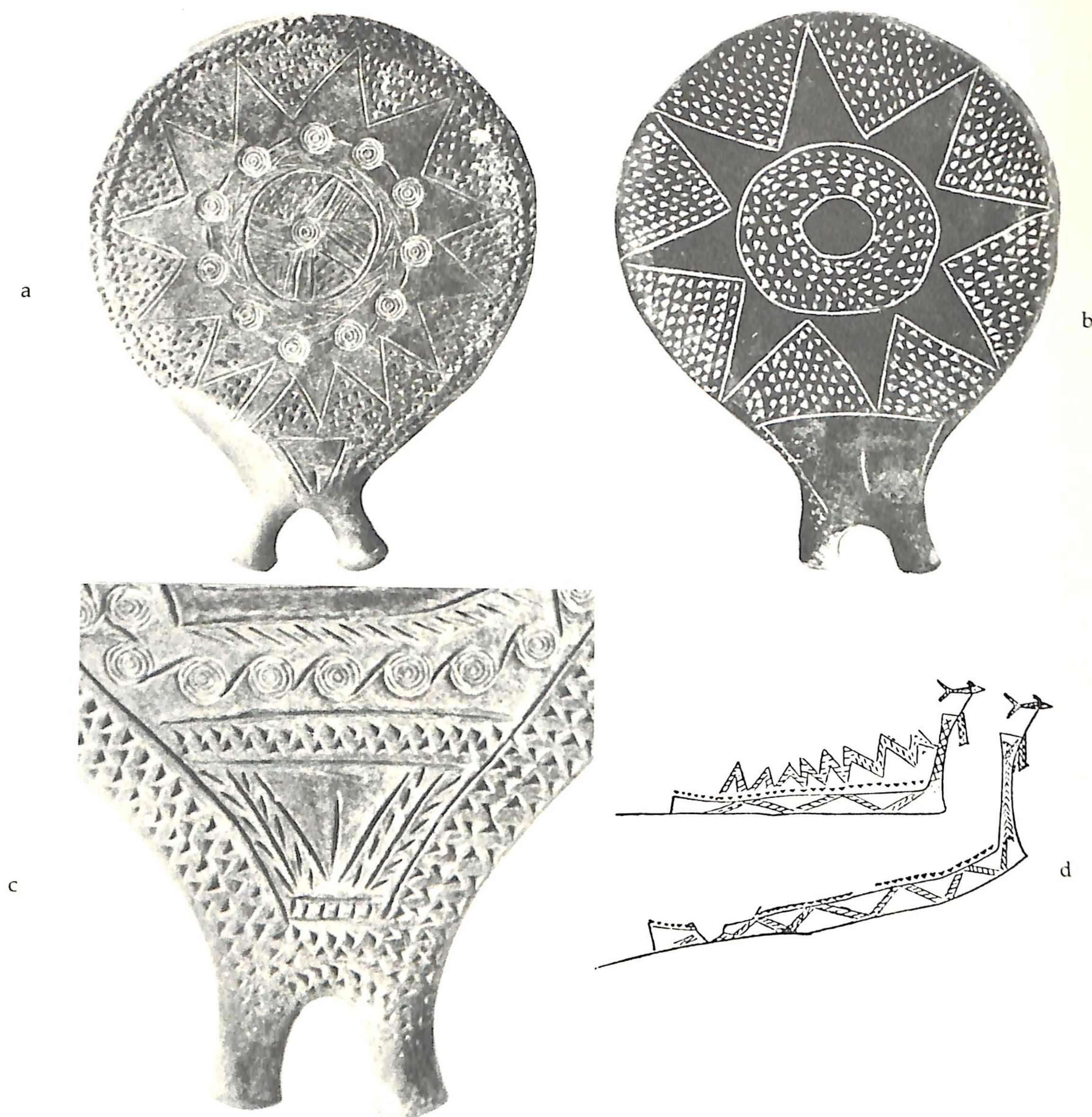


Fig. 93. Cycladic "frying pans" and their symbols, 2500–2200 B.C., Syros, Cyclades.

R. F. Willets's and especially K. Branigan's discussion of the evolution of the "snake-goddess" highlight the disparate religious appurtenances of the Early Minoan period which eventually were absorbed into a single cult with the serpent as its dominant symbol.[78] This dominance, and the characteristic exposure of the goddess's breasts, contrasting with her otherwise elaborately concealed nudity, culminated a long development going back to the Neolithic naked fertility figurines of native populations from which she cannot be dissociated.

Naked figurines from Neolithic Crete in which the pubic region is as clearly defined as in the cases described above, and which also have a serpent intimately associated with it, are rare. The closest Cretan "parallel" to the



Fig. 94. Cult images from Crete: *a*, the "serpent goddess," faience, Middle- Minoan III, 1750–1580 B.C.; *b*, amuletic bead from the cemetery at Kalochorio, Early Minoan, 2800 B.C.; *c*, clay idol, Neolithic, with simple zigzag symbol of serpent engraved upon the torso; *d*, clay image from the cave of Eileithyia, goddess of childbirth, Inatos; *e*, open-fanged serpent on black painted buff pottery; *f* and *g*, crude images from Anavalokhos (Protogeometric period) and from an unknown site. Compare *g* with fig. 3*b*, 4*c*.

Mesopotamian or Canaanite images is provided by a small, three-sided prism bead, dated to 2800 B.C., whose amuletic nature is discussed by V. E. G. Kenna.[79] One face of it shows a human figure (of indeterminate sex) with outstretched arms and legs. On either side is a winding serpent, its head directed towards the groins or hips (fig. 94*b*). However, in another figurine with stubby

outstretched arms, presumably representing a female deity, the chest, rather than the pubes, is marked by a five-fold zigzag of two parallel lines which widen at one end and terminate in short indents as if to suggest a serpent's gaping mouth and fangs (fig. 94*c*).

Innumerable crudely made terracotta figurines of females give substance to Branigan's and Willets's expositions of the serpent cult. They occur in Crete and elsewhere in the Aegean over an extended period beginning with the Late Neolithic and especially Early Minoan I. They have sinuous lines, zigzags, or intertwined meanders incised or painted on them. These markings usually rise vertically over the front part of full-length skirts from foot level to the level of the pubes. Thus, they are reminiscent, if only superficially, of the idols of Ishtar and Astarte. A specimen with a zigzag on the skirt (fig. 94*d*), from the sacred cave of the goddess Eileithyia, protectress of childbirth, was found amidst clay models of ships, double axes, and couples in erotic postures. Excavations at Amnisus, Crete, indicate that her cult was in continuous existence from Neolithic to Roman times. A black-painted figurine in buff-colored clay, now damaged, has an infant feeding at the breast and a pair of intertwined meanders that rise to the level of the pubes. In an anthropomorphic vase from Koumasa a serpent is coiled around the neck and a pair of intertwined zigzags ascend towards the breasts.[80] In other cases, symbols painted or incised over clothed images rise no higher than the level of the crotch and are not mere decorative representations of laced-up skirt fronts; ceremonial skirts, at least those worn by Cretan priestesses, were slit in the back or part way up on either side, not in the front, and surviving costumes continue the ancient traditions.[81] The pubic associations (if any) of an open-mouthed, naturalistic serpent are only subtly manifest in the painted pottery idol in figure 94*e*. Its orientation seems to symbolize not the phallus, but birth itself or, as the Greeks of a later epoch believed, perhaps rebirth of a dead hero in the form of a serpent.

Some archaic Cretan terracotta images bear a series of circular depressions that are intriguing but hard to interpret. A hollow, cylindrical figurine of the Protogeometric phase, from Anavalokhos, Crete (fig. 94*f*), has a noseless, mouthless face with pellet eyes, of which the right one is missing. It is only about 8 centimeters in height. The head is shaped as if a cloth hood covered it to the shoulders. The left arm is stubby and outstretched; the right arm is broken. Two vertical rows of seven cupmarks, each with a central pin-prick, are engraved in front and on each side. The idol probably represents a female with pellet-bosses for breasts, now detached, for there is faint indication of this on the proper left side. A flat, notched strip of clay, now broken, is appliquéed to the torso and may once have passed over the shoulders. The unbroken end tapers, giving the impression that it represents a serpent's head.

In a somewhat similar crude figurine measuring about 7 centimeters in height (fig. 94*g*), the body is solid and roughly rectangular and represents a female. A straight narrow groove incised from foot level to the level of the pubes and five shallow cuplike depressions aligned on each side of the groove yield a simple symbol whose significance is best appreciated through two objects discussed in chapter 1. This symbol is also seen on a very tiny clay object of the Neolithic period, sketched in figure 3*b* on the basis of a photograph by Christian Zervos[82] (of the unrestored object), with which features observed by me after its restoration are combined. Sir Arthur Evans regarded it as a spool for winding

thread,[83] but the numerological overtones of the markings on its surface betray a cultic significance. The symbol in question in figure 3*b* is on the upper surface and has six pairs of "cupmark" depressions filled with white paste. Diagonally from it is a group of five tiny circular marks in each of five rows (Zervos's photograph shows only three rows). A sinuous line with two "eyes" and a broad zigzag also mark the upper surface. Two groups of incised circlets occur on one of its sides. Each group has five circlets in each of three rows. There are two fivefold zigzags incised on the lower surface. The symbol common to the upper surface of this tiny object and the idol in figure 94*g* is of interest inasmuch as it is also painted on a Mycenaean terracotta bull (fig. 4*c*) much like the zigzags and serpents in Cypriot images (fig. 4*a*,*b*). Bull and serpent, as is well known, are sometimes jointly involved in the fertility cults of pre-Hellenic and later periods.

The importance of symbols like these in the cult of fertility (and its corollary, infant mortality) is underscored by finds like those described in Mycenaean mortuary contexts. A storeroom was "filled to capacity with a series of 16 clay figurines [some with] hands on their breasts; patterns of intertwined meanders bordered by dots ascending on the dress from foot level to between the breasts . . . [together with] two complete coiled snakes of clay and fragments of at least four more."[84] Stylized Mycenaean clay images of females (of the type called *kourotrophos*)—common among the grave goods in children's burials—have typically cylindrical lower parts, flat, winglike torsos, piched-in faces, and triangular (viper's?) heads. Many of these hold in their atrophied hands a baby, sometimes serpent-like in form, and there are chevrons, zigzags, and sinuous lines painted on the images.[85]

Pottery vessels with triangles and obviously ophidian motifs painted on them are innumerable in the Aegean area, but the abstract quality of the patterns in a large fraction of them is liable to obscure their true significance. Friedrich Matz describes a Minoan jar with a band of small, closely spaced triangles painted below a broad panel consisting of a scale motif.[86] D. G. Hogarth and F. B. Welch note a "predilection for [hatched and chevroned] triangles and zigzags" on the Kamares ware of Crete and its immediate Neolithic predecessors.[87] A pot from the Cyclades[88] has large hatched triangles and immediately below them an encircling sinuous line. The painted ware of Tiryns includes many pots and sherds with scale and triangle motifs.[89] Because the closest affinities of relics like these are traceable to southeastern Europe, a greenish stone stele from Souphli, Thessalia, northern Greece, may be pointed out as one of the most illuminating specimens (fig. 95*a*). It is not precisely datable, though it was excavated from a Neolithic site in which the strata contained nothing other than cremation burials of various prehistoric periods. The site is only 4 kilometers from others in the Larissa area where human habitation of Thessalia is attested as far back as twenty to thirty thousand years ago. This almost flat stele is about the height of a man and incorporates some human features—feet, arms (the right hand pointing to the pubic region), diminutive breasts, and a triangular head. Perhaps the two most noteworthy features are the small face (an infant's?) in the center of this triangle and the serpents carved in low relief on the narrow sides of the stele.[90]

It is redundant for our purposes (and also not feasible in this book) to give details of the many intriguingly cryptic renditions of conjoint ophidian and sexual symbols, the chronological sequences of different cultures, the possible



Fig. 95. Neolithic Northern Greek and Eastern European cult relics: *a*, flat stone stele from Souphli, Thessalia, Greece, showing a small face, presumably an infant's, peering out from the triangular head, diminutive breasts, right hand pointing to the pubes, and serpents engraved on its narrow sides; *b*, clay "altar of Kökénydomb," Tisza culture, 2800–2500 B.C., Hódmezővásárhely-Kökénydomb, Hungary; *c*, flat female figurine with triangular head, Alföld Linear Pottery culture, 4000(?)–2800 B.C., northern and eastern Hungary.

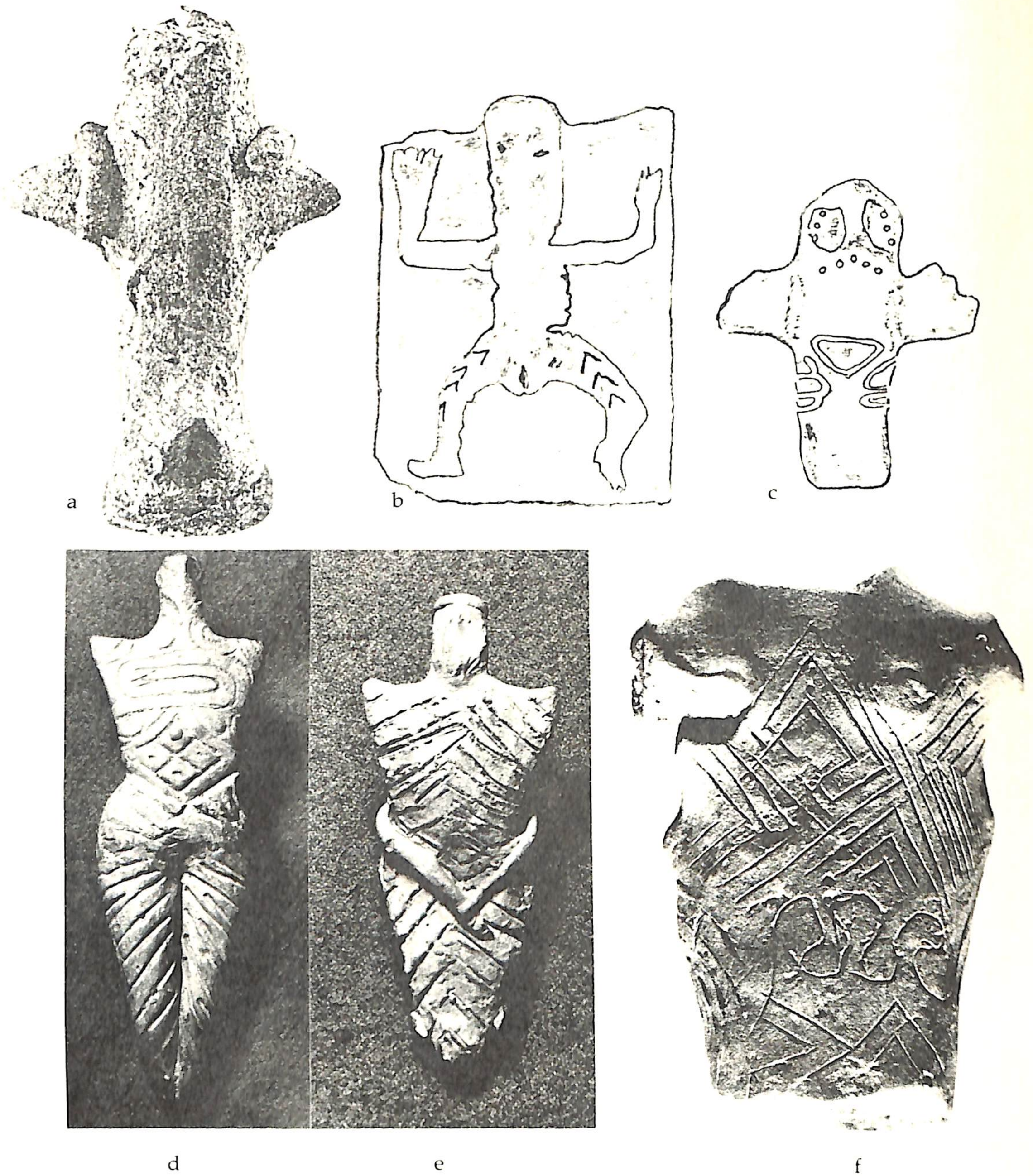
interactions of coeval ones, and other factors important in specialized field studies of any geographically contiguous region. Southeastern European relics make the task no lighter, as is proven by the three examples from Albania, Hungary, and Czechoslovakia (frontispiece and figs. 12 and 22*b*) already discussed in another context. However, to conclude this chapter, some important items of Neolithic and Bronze Age pottery idols, vessels, or sherds may be

included with profit. I shall group them in a rough order, viewing the various countries and ancient cultures of southeastern Europe as a whole for the sake of convenient visual comparisons, with the prefatory remark that most of the cultures of Albania, Yugoslavia, Bulgaria, Rumania, and Hungary in several ways betray southern (i.e., Greek) resemblances in their pottery, though each culture put its own stylistic stamp on its products. For example, according to Kalicz, the art of the Körös (Criş), Bükk, and especially Tisza cultures of Hungary gave a secondary role to their male deities and made mostly female clay figurines, with "emphasis laid on the head and neglect of the sexual character [meaning, presumably, neglect in positioning the triangle where it properly belongs on the human body]. The *head* in nearly all cases was triangular-shaped and diminishing from the trunk upwards."[91]

The Bükk idol in figure 12 exemplifies this clearly through the head of the serpent that forms part of the zigzag pattern incised on it. The closest correspondence to the Thessalian stele described above or, rather, to its triangular head exists in a triangular block of clay known as the "Altar of Kökénydomb" (fig. 95*b*), a cult object of the Tisza culture (2800–2500 B.C.) from the same region of southern Hungary as, and successor to, the Bükk. Its surface has no naturalistic serpent motifs but is ornamented with incised zigzags. There is a clear triangular area on one side within which occur the merest suggestions of a face—two depressions indicating the eyes, button nose, and two almost parallel, short incisions above these. This symbol, at least according to one view, is the astral sign Capricorn, has solstitial and astral significances comparable to the Egyptian, and is analogous to the pyramid of Cheops.[92] This interpretation, however, is conjectural and rather less credible than the idea that the symbol within the triangle was meant to represent an infant's face and signified childbirth just as the Thessalian stele did. In fact, this "altar" of Kökénydomb was excavated in close association with two ochre-painted clay images of a bare-breasted goddess with a prominent navel, dubbed the "Venus of Kökénydomb." Zigzags incised in the clay decorate her from the midriff to the knees, and she is portrayed seated upon a thronelike stool, her legs spread apart to reveal the pubic triangle. Idols of this kind were apparently common and kept in domestic shrines, to judge from the frequency of fragments excavated from settlements of the Tisza culture.[93]

The southeastern European idols exemplified in figure 96 occasion only brief comments. Almost all of them are crudely fashioned, as if they were intended for private rather than communal use. The variations are many. These figurines generally have diminutive breasts, but their femininity is evident from their steatopygia. In crudely made specimens *(a–c)* ophidian symbolism is not obvious. Though it has been termed "bracelets,"[94] the ropelike piece of clay appliquéed over the shoulders of idol *a* is probably a serpent, for this figurine is related to many ceramic objects from Yugoslavia (for example, that in figure 3*a* and vessels of the cult from related sites in Czechoslovakia)[95] that portray the animal naturalistically. The chevrons of *b* seem to have more than decorative value and perhaps have the same significance as those in figures 96*f*, 14, and 15 and in countless pottery motifs in Trans-Danubian, Aegean, and Mesopotamian art which, when viewed in their proper context, suggest that they are ophidian cult symbols.

In figure 96*c*, the bands around the triangle seem analogous to the elaborate



pattern of incisions upon the buttocks of one of the most interesting, perhaps communally used, idol *g*, from Bulgaria. This figurine, from one of the lowest strata representing the transition between the Palaeolithic and Neolithic of southeastern Europe, has two especially noteworthy features: First, the fissure in the clay between the legs continues into the center of the pubic triangle and ends there in a knob. Second, the stylized incisions on the buttocks wind from the rear towards the triangle and also end in knobs that almost touch it on either side. The artistic variations of this motif are very wide and known right through the Bronze Age, represented by the idol in figure 96*k*. Idols of this type were commonly placed in urns, many of the latter shaped like human breasts and,



Fig. 96. Neolithic Eastern European idols: *a*, from Pavlovac, Yugoslavia; *b*, Starčevo-Criş culture, 5500-4000 B.C., from Sarvas, Slavonia; *c*, Gumelniţa culture, 2700–2000 B.C., from Ruse, Bulgaria; *d* and *e*, "Cu Colier" figurines with ophidian symbols on the chest and pubes, from Truşeşti, Rumania; *f*, idol with a sinuous serpent on pubic region, Vinča-Turdaş culture, 4000–3000 B.C., from Rast, Oltenia, Rumania; *g*, two views of the idol of a seated deity with stylized serpents on the buttocks pointing their heads at the pubic triangle, Palaeolithic-Neolithic, from Popovitza, Pazardzic, central Bulgaria; *h*, crude image, pre-Cucuteni culture, from Tîrpeşti, Rumania, with the same symbols as those of *g*; *i*, androgynous (or serpent-holding?) image, Tripolye (pre–Cucuteni III) culture, from Sabatinovka, U.S.S.R.; *j–l*, clay images with serpent symbols incised near the pubes, at the neck and chest, and on belts, Bronze Age, Gîrla Mare culture, 1600–1200 B.C., southwestern Rumania.

like the idols, incised with abstract patterns of sinuous lines and occasionally even indubitable serpent motifs. Large numbers of these idols and urns buried along with incinerated human bones are known from the necropolis of Cirna, among others, in Rumania.[96]

Mortuary pottery of the type exemplified in figure 97 has been excavated plentifully in eastern Europe. In many objects, especially of the Neolithic period, reliefs and incised motifs like those in figure 97 *a* and *b* are unambiguously identifiable as ophidian, but painted motifs like those in *d–j* are problematic. Typical of northeastern Rumania and adjacent areas of the U.S.S.R. (where this painted ware is attributed to the Cucuteni and the synonymous Tripolye culture, respectively), the serpent is obvious in some cases, such as *c* and *e*, but obscure in others because of its extreme stylization. Further complication is caused by partly anthropomorphic birdlike figurines which, quite reasonably, are identified with a goddess. According to Marija Gimbutas, this deity had both avian and ophidian attributes, and these are represented either together or separately. On Cucuteni vases (like those in *d* and *g*), she writes, this goddess's eyes, or her eyes and beak, appear above symbols of water or falling rain.[97] The avian symbols in many cases, in my opinion, are moot at best, while the identity of the symbols beneath, as aquatic, is questionable. In many painted Cucuteni vases (for example, *d*) the pubic triangle is identifiable unmistakably, and it may be associated with or replaced by either naturalistic serpents *(c, e)* or ophidian emblems such as ventral scales or zigzags *(f, g, h)*. It is important to note that in Silvia Marinescu-Bîlcu's extensive catalog of *pre*-Cucuteni relics of the same region, specimens of bird images or clearly avian motifs are rarely detectable, if ever they are listed, whereas representations of serpents incised in the clay *(b)* are innumerable.[98] The possibility that the eyes and nose (or so-called beak) portrayed on Cucuteni painted vases such as *d* and *g* are those of a primarily ophidian deity is, in my opinion, hard to overlook. Similarly, the question remains whether most of the clay figurines of non-Cucuteni cultures, illustrated by Gimbutas, may not be deceptively bird-headed, their actual human or caprid character concealed by stylization. The association of caprids and serpents is well documented in the pottery of eastern European cultures of the pre-Cucuteni Neolithic[99]

To sum up: Genital symbols, whether they are contrived consciously or subconsciously, are too fickle to justify any cross-cultural generalization that the serpent is predominantly a phallic, or vaginal, or even a universal sexual symbol. In secular myths involving sexuality, serpents that seduce or ravish an individual are no more apt to be conceptualized as male than as female. The only sentiment conspicuously shared in these myths is that of aversion to the animal.

In some cultures whose literary or archaeological records clearly attest to worship of anthropomorphic deities of fertility, ambivalent awe of the serpent has impelled the linkage of ophidian attributes mostly with female deities. Whether or not this connection is universal is unknown, but I am not aware of many instances of this divine power's being simultaneously assigned to an equally important male counterpart. There are no male equivalents of the Hindu ophidian goddesses Mudammā and Manasā. In the Hellenic world, despite the caricature of Zeus Sabazios as a bearded serpent or golden adder in sacred marriage and fertility rites, his status as a symbol of fecundity paled in comparison with that of the goddess of childbirth, Eileithyia, and other goddesses who



Fig. 97. Eastern European Neolithic ritual pottery with ophidian and pubic-triangle motifs: *a*, clay bowl with naturalistic serpent appliqué on the inside, Neolithic, Dvory nad Žitavou, Czechoslovakia; *b*, incised pattern on a pot of the pre-Cucuteni period, ca. 3000–2700 B.C.; *c–g*, painted pots, Tripolye culture, southwestern U.S.S.R., bordering Rumania, with ophidian and genital symbols explicit in *c* and manifest in varying degrees of stylization in the others; *h*, floridly painted pot, Cucuteni-Ariuşd culture complex, 2700–2000 B.C., Rumania; *i*, pot with highly cryptic patterns, Starčevo culture, Fewkes utan, Serbia; *j*, a pot of the Suciu culture, Felsöszös, Hungary.

were "originally and for long of more importance than the god."[100] In Sumeria, the pantheons of "a number of the oldest cities were headed by a goddess," some of whom, like Inanna, Kadi, and perhaps Nintu, had ophidian attributes and whose consorts were "of clearly lower rank."[101] In a number of southeastern European cultures of the Neolithic period, "the male existed only as a force to fertilize the female deity and thus played a secondary role in art."[102]

In every culture, the social and historical factors that determine the sex and iconographic symbols of a deity—whatever the latter's role may be—are complex. When battling the antigods the Hindu goddess Durga leads armies as ferociously as the much more ancient chief of warriors, the god Indra, just as, in the pantheon of the Greeks, the god Ares and the goddess Athena are equally warlike—an activity which is normally the preserve of males—but cases like these do not obscure the fact that in general men and women alike tend to elect male deities of war. Similarly, ophidian deities of fertility and childbirth are generally female, perhaps because the superstitions involved affect women intimately. Thus an ancillary factor may exist amidst the several biological ones that determine human sensitivity to the serpent: namely, the possibility that women are more prone to ophidiophobia than men and have contributed significantly to ophiolatry through the cult of fertility. To confirm this only through cultural considerations would be to rely on a narrow viewpoint, in addition to being difficult, for, as the next chapter reveals, a genetic basis for sex-linked differences in sensitivity does exist.

CHAPTER 5

The Biological and Protocultural Expressions of Ophidiophobia

The cultural traits noted so far are impressive, but the fact remains that the course of an individual's daily life, even in the rural tropics, is hardly dominated by terrifying thoughts of serpents. Individuals neurotically apprehensive of snakebites are exceptional; yet, societally, side by side with an ambivalent awe that is reflected almost universally in religious petitions, the serpent is reviled far more than is ecologically warranted. If not divine sentiments, it incites at least active antagonism. The venomousness of a few species appears to have contributed decisively to the origins of ophidiophobia and, eventually, ophiolatry, but venom per se cannot have been the only determinant. As a numen, the venomous scorpion is relatively unimpressive even in its tropical haunts, while, in the colder zones, the serpent's notoriety persists powerfully.

I now submit that long before ophidiophobia was vented in cultural traditions, certain ecological forces aided by the chemistry of the body left an indelible mark upon the human mind. Though the serpent's mere form and

sinusoidal movement provoke an instinct that is latent and subdued in widely varying degree in different individuals, the latter collectively foster symbols that are impelled by scorn of the animal.[1]

These attitudes hinge on two complex psychological factors affecting all higher primates—fear, which is relatively transient and whose physiological parameters are described below, and the more persistent offshoot of fear, emotional stress. Several highly specialized subdivisions of the biological sciences converge here and necessitate an understanding of the physicochemical and anatomical bases of the most rudimentary forms of response to external stimuli in animals neurophysiologically much less advanced than the primates. I shall discuss these rudimentary responses, though only cursorily,[2] after a few prefatory remarks.

Practically every facet of our knowledge of these is empirical, in accord with the principles of genetics and evolutionary biology, and applicable to nonhuman and human primates alike. However, some anthropologists, by advocating the supremacy of the cultural determinants of human behavior, do insufficient justice to similarities of behavioral patterns that are not only innate in anthropoid apes and man, but also powerful factors in the coherence of their respective societies. The influence of acquired cultural traits on the attitudes of individual men and women cannot be denied but, at least with regard to ophidiophobia, is secondary and inconsistent with the view of one anthropologist that "no specific human behavior is genetically determined; that human beings are capable of any kind of behavior . . . that the kind of behavior a human being displays in any circumstance is determined not by his genes, though there is of course some genetic contribution. . ."[3] Another cultural anthropologist "is not convinced that fear of poisonous snakes is the proper etiology for the special ideational attention given to serpents"[4] and favors, instead, certain generalized structuralist explanations verging on psychoanalysis. These will be questioned separately.

It is important at the outset to stress that the evidence from modern experimental psychobiology suggests that more than one simple, direct response may be stimulated by any phenomenon that evokes fear. The most obvious and predictable end result, of course, is that an individual will attempt to avoid the stimulus. Experiments involving both laboratory animals and human subjects indicate that the responses have measurable autonomic, cognitive, and behavioral dimensions. Though these three undoubtedly are interrelated, they also appear to be partially independent, so that responses falling into, and measurable by the criteria of, one system are not simple reflections of responses belonging to another.[5] Thus in laboratory animals conditioned autonomic responses become extinct long before responses in the category of conditioned avoidance behavior. These three dimensions have been studied by H. E. Schroeder and A. R. Rich with several techniques, including physiological measurements, with particular reference to the responses of human volunteers exhibiting marked sensitivity to the test object—a harmless serpent.[6] The distress of these agitated individuals was but the culmination of a very complex sequence of biochemical reactions in their bodies—reactions with measurable side effects including greatly increased secretion of the hormone epinephrine, accelerated heartbeat, and altered electrical resistence of the skin as direct consequences of the visual stimulus. The persons chosen for these laboratory tests were American female college students. Their involuntary physiological reactions, however, can hardly

have been different from those of an average human being surprised, under natural conditions, by an undulating serpent poised for attack. A confrontation of this kind would most likely impel one to withdraw immediately, but "fascination," the tendency to be momentarily immobilized, would not be unusual.

Of course, any dangerous animal (and, as we will see in the concluding chapter, even an innocuous one) has the potential of engendering fear, but reactions to these other species are not quite the same as those of the ophidiophobe. Freezing and crouching in fear is a common characteristic of many mammals, but this transient state soon gives way to an emergency, or what is often described as the "fight or flight," reaction. The primary cause of this is the sudden release of epinephrine into the bloodstream. Concomitantly, physiological changes are initiated by the sympathetic nervous system: the heart beats faster and more vigorously to transport oxygen quickly, the spleen contracts to release more red blood cells for this purpose, stored glycogen (sugar) is released from the liver for increased muscular activity, blood supply to the brain, skin, and viscera is affected, pupils dilate, thus enhancing visual efficiency in poor light, bronchi distend to take in more oxygen, and both the coagulative capacity of the blood and lymphocytes (which repair damaged tissue) are augmented. All these changes occur swiftly, within a few seconds or minutes, and, evolutionarily speaking, their survival value stems from their capacity for mobilizing the body's resources for fight or flight—generally with, or from, an animal's natural predators. It is particularly important to remember that this chain of events is set in train only when particular shapes, colors, sounds, smells, or types of movement have a spatial relationship conducive to the transmission of an appropriate visual (or other sensory) stimulus to the sympathetic division of the autonomic nervous system of the normal member of every species. The repercussions for animal behavior, as we will see below, are complex.

THE STIMULUS OF VISUAL PATTERNS

The efficacy of light in stimulating the biochemical processes that influence an animal's overt behavior is inestimable. Even single-celled microorganisms are repelled or attracted by light of certain colors or intensities. The cellular membranes of the bacterium *Halobacterium halobium*, for example, contain rhodopsin, the same pigment that is present in the retinal cells of the eyes of higher organisms. Certain flagellated protozoa and algae have other mechanisms, such as an "eye"-spot that is sensitive to light and propels the cell body towards it, or away if it is too strong. The mechanisms underlying these locomotor behaviors, of course, cannot be compared with those of complex multicellular organisms. Modern research, however, reveals that even single-celled species possess an extremely rudimentary, short-lived "memory" or "learning" capacity—actually, an adaptability or tolerance—that enables them to modify their responses appreciably under duress. Thus, an organism's innate tendencies are not always driven to fullest expression.

In higher organisms like the vertebrates, innate (or instinctive) behaviors are greatly complicated by and dependent upon the degree of development of the nervous, muscular, and hormonal systems to the extent that they involve the faculty of stronger memory of visual experiences. In the mammals, social com-

munication between the individuals of a species is an additional factor superimposed by nature on innate sensitivities. Aided sometimes by sound and smell, it is primarily the visual stimulus that enables a diurnally active mammal to recognize a potential predator and flee from it or to be drawn by a member of the opposite sex of its own species. Flight (or aggression) is but one way in which intuition expresses itself in nature, and it is comparable to what the experimental psychologist calls avoidance behavior in the case of laboratory subjects exposed to an aversive stimulus.

The distinctive feature of cases like these is that the complex chain of neurophysiological responses to visual stimulation is governed by the factor of selectivity. In addition, these innate sensitivities and the effectiveness of extraneous, modifying influences vary with the degree of evolutionary development of the species. Examining the visuo-motor responses—i.e., automatic behaviors triggered by specific visual images—in a few lower vertebrate species may shed some light on the complexities encountered in the primates, including man.

The European stickleback *Gasterosteus* is a small freshwater fish whose pattern of normal courtship behavior can be verified experimentally as well as artificially altered in aquaria. In spring, male sticklebacks isolate themselves from their schools, move to shallower water, and prepare themselves for breeding by constructing nests of algae and sand, to which they will eventually steer the females for fertilization. In the meantime, a male's normal body colors change from dull brown to a greenish hue, the black dorsal spots reduce themselves to dots, thus exposing a tissue of whitish-blue cells, the eyes become deeper blue, and, most important, the belly turns red. It is this red which enables him to identify and drive away other males that invade the vicinity of his nesting site and engage in elaborate courtship of up to four females (which lack these color changes but possess abdomens swollen with eggs) until they are led into his nest. On fertilizing their eggs, he ceases to court females and devotes himself to protecting the eggs and the young hatched from them. The visuo-motor response to the red belly is so automatic that males will aggressively attack even the most unfishlike plaster models painted with red belly bands but court exact replicas of gravid female stickleback that are not painted red (fig. 98). The females shown similar preferences.

These behavioral responses illustrate the concept of *innate releasing mechanisms*. Visuo-motor reponses of sticklebacks are elicited by several visual cues, but none is so dramatic in its effects as those involved in normal reproductive behavior. The red underbelly color sets in train a complex series of events which even individuals isolated for experimental study repeat to such absolute perfection that they may only be regarded as intuitively accomplished according to a *fixed action pattern*. This pattern is as specific and constant in sticklebacks as other patterns are specific and constant in every other animal species, occurs the very first time an individual is exposed to a specific stimulus, is relatable to anatomical structure and the ecological milieu, and remains latent until the stimulus activates the innate releasing mechanism. Thus, in sticklebacks, red color associated with an approximate fish shape is one of the operational visuo-motor stimuli. Its effects are the end product of prolonged evolution involving responses in the nervous system to springtime in the northern hemisphere, when days lengthen, freshwater ecology alters, and subtle changes are induced by

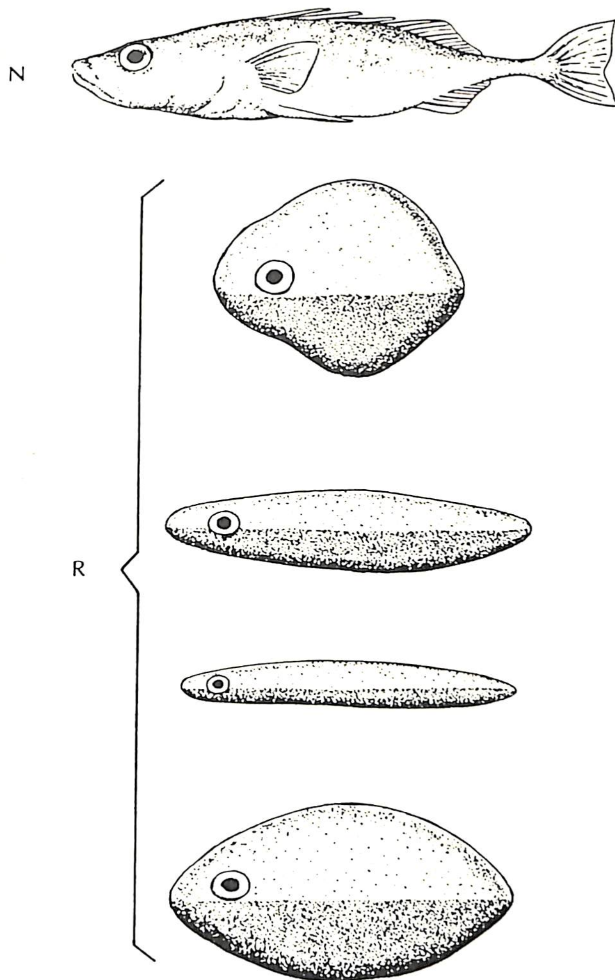


Fig. 98. Models used for identifying the visuo-motor stimulus characters that elicit the sexual behavior of three-spined sticklebacks. The four lower, crude models have their bellies painted red and cause positive reactions in both male and female sticklebacks (aggression in males, attraction in females), whereas the uppermost model, which lacks a red belly but is otherwise an exact replica of a male, fails to elicit these reactions.

hormones that produce egg-laden females with swollen abdomens and males with red bellies and the fixed action pattern of each sex.

Above all, an individual's predisposition to a fixed action pattern is *inherited.* A stickleback variety occurring in one of the streams of the Olympic Peninsula in North America is jet black. This is a color mutant that established itself in a glacial lake perhaps over eight thousand years ago presumably because of the survival value against predators this mutation conferred. These jet black males and females have bred successfully inter se over these millennia, yet, when in experiments the females face a choice between red-bellied and jet black males, the former are preferred five times out of six—a remarkable persistence of the genetic foundations of this subspecies's visuo-motor mechanism.[7]

It is possible to study experimentally a feature of evolutionary potential in

organisms whose survival itself depends on visually oriented behavior—their capacity to *learn* to respond to unrealistic visual cues that spell danger. Even forms as neurally undeveloped and lacking in intelligence as fish exemplify this, though, ironically, intelligence is the "capacity to learn from experience." D. W. Jacobs and A. N. Popper subjected experimental and control groups of *Lagodon rhomboides* (the pinfish) to mild electric shocks immediately after exposure to visual cues under precise, scientifically defined, measurable conditions.[8] Their object was to ascertain whether the fish could be trained to associate a visual cue—strong light directed briefly into the tank—with an impending electric shock and escape the latter by jumping over a hurdle to the safe side of their aquarium tank. Since visual cue and electric shock were separated by a ten-second interval (with sixty second pauses between repeats), the fish had to *learn* to respond to the visual cue and jump away from the shock-dealing side within ten seconds. The pinfish did indeed show this capacity, a notable feature of the experiment being the differences between individual fish in achieving success. It took them from ten to twenty-six days, yet eventually all exhibited the artifically induced behavior in the face of the aversive visuo-motor stimulation. Because of their low level of intelligence, however, they were apt to forget their learning swiftly. It is superfluous to add that acquired capacities cannot be transmitted genetically.

These observations on sticklebacks and pinfish, taken together, illustrate some points of eventual significance in this book. Whether aversive or attractive, behaviors stimulated by visuo-motor mechanisms fall into two categories: (*a*) innate fixed-action patterns that are genetically transmitted and quite permanent despite possible minor variations in degree of expressiveness among individual members of a species in accordance with the laws of genetics, and (*b*) aversive, non-"instinctive," acquired or learned behaviors, i.e., those which lack a natural genetic basis and can only be maintained by constant physical exposure to the stimulus, which must also be quite noxious.

P. K. Chu and G. McCain's experiments with amphibia—animals whose brainstems are fishlike and whose cerebral hemispheres not much larger than those of fish—involved the "training" of toads to discriminate between two simple alternatives—turning either to the left or to the right in a compartmented T-maze—with the reward of food (a worm hidden from view) for choosing the correct one of two paths to it.[9] Positive reinforcement of discriminative learning by this device was found to yield a maximum of 60 percent correct responses after 160 arduous trials, not unimpressive if one takes into account the poor development of the amphibian brain. What is equally noteworthy is the rapidity with which this rudimentary learning was forgotten during extinction trials, when rewards of worms were denied to the toads despite their having chosen the correct alternative. Within fewer than 20 such trials the previously acquired ability dropped sharply to below the level of pure chance, i.e., the correct choices became, in statistical terms, only accidental. These experiments involve no visuo-motor stimulation but indicate that differences are apparent in the speed of learning between individuals of a species as primitive as the toad.

How discriminatory visual acuities are even in the lower vertebrates and how automatic motor behavior can be under visual stimulation under natural conditions may be gauged in reptiles, which are phylogenetically intermediate between the amphibia and the birds and mammals. Reptilian cerebral enlarge-

ment (size in proportion to the body as a whole), however, differs little from the amphibian. There is little suggestion in reptiles of the complex lamination which is characteristic of the mammalian cortex. The white matter is not abundant and ony primitively differentiated. Nothing comparable to the mammalian "motor area" occurs in the reptilian cortex. Yet functional investigations indicate that the basal regions of the hemispheres serve in orienting the reptile vis-à-vis its environment "perhaps by facilitating neural mechanisms at lower levels and by integrating the elements of behavior patterns."[10]

A remarkable instance of visuo-motor effects in reptiles is observable in certain species of sea turtles that lay their eggs on sandy shores and whose hatchlings crawl across considerable distances consistently in the direction of the sea rather than away from it. They achieve this instinctively (if they evade predator birds) immediately after emerging from their eggs by correctly orienting themselves seaward despite the absence of any direct sensory contact with familiar, fixed landmarks. This ability is apparently a tropotactic reaction dependent upon the relative qualities of light reflected from the horizon of the open sea and the darker tree line on the landmass beyond the beach where the eggs have hatched. Thus the sharp sense of direction impelling the newborn turtles into the sea, even though the latter is initially out of sight, appears to be the consequence of both eyes' receiving an equal intensity of illumination when the head (and body) are turned seaward.[11]

By contrast, mammals display a greater complexity of behavioral responses to visual stimuli because of the superior anatomical differentiation of their eyes and brains. The rat, for instance, can learn simultaneously to avoid several punishment-inflicting variables and to retain clearly better memories of its experiences in a complicated maze than a frog or a bird subjected to fewer variables in a simple maze. The sharp qualitative and quantitative differences in discriminative learning between different species of mammals (and, less sharply, between individuals of the same species) are clearly correlated with intelligence,[12] as is apparent in different breeds of the domesticated dog, all of which belong to a single species.

The native intelligence of primates places them in a special position as regards visuo-motor coordination, as much because of brain development as because of the "yellow spot" or macula lutea, a feature of ocular anatomy that greatly augments their visual acuity. However, involuntary, aversive behaviors under visuo-motor control inevitably raise semantic problems concerning the word "fear," which describes an emotion applicable primarily to humans. While "fear" is sometimes attributed to dogs, whether one may extend its usage to taxonomic groups lower than the primates, or even to *primitive* primate genera, is a matter of opinion. Pinfish escaping electric shock and male sticklebacks aggressively attacking other males during breeding time can hardly be described as behaving out of fear of pain or fear of sexual competition, respectively. In each case, certainly in the stickleback's, the behavior is regulated by hormones, though these differ in quality from a mammal's. Can a rat, the favorite laboratory animal in psychobiological experiments, be said to possess the emotion of fear? Perhaps not. Yet an immense literature documents the facts that rats exhibit innate aversions to various stress-inducing stimuli and that the responses are *inherited*, sharpened (or reduced) by inbreeding, conditioned by light or specific objects, and radically modifiable artificially because of the rat's ability to

remember its experiences.[13] Most importantly, in rats subjected to stress, the levels of adrenal medullary hormones (principally epinephrine) and pituitary-adrenocortical, posterior-pituitary, and gonadal (affecting differential responses in males and females) hormones are immediately and sharply augmented. Precisely the same types of qualitative and quantitative changes occur in humans experiencing fear. In addition, experimental removal of specific areas of the brain or their natural dysfunction, as in schizophrenics, affects both hormone production and the normal pattern of response to an aversive stimulus. A mechanistic approach to the biochemical and psychophysiological bases of visual image formation and information processing in the brain, the role of memory, motor coordination, and cognitive behavior, and other pertinent factors[14] must not, however, obscure the distinction between elementary fear and its emotional display.

In primates, as in mammals in general, because the genetic and physiological parameters of responses to fear- or stress-inducing stimuli are essentially constant, the terms "aversive behavior" and "fear-mediated behavior" have much the same connotation. One of the commonest overt bodily reactions to an aversive, unconditioned (i.e., not acquired through association with a harmless stimulus) cause of tension—such as sudden thunder or lightning—involves a throwing back of the ears, a blink of the eyelids, and a tightening of the muscles of the face, neck, arms, abdomen, and, last, legs. These tensions occur within 20 to 350 milliseconds, and their side effects may pass quickly or persist for a while depending on the severity of the shock and the excitability of the individual. Subsequent repetition of the shock may delay effects and even enable one to ignore it because of habituation. These responses are part of the "startle" complex and properly belong to the category of fear. The startle may be caused by the *unexpected, sudden* appearance in one's vicinity of almost any repugnant object. Why, then, do certain visual images elicit marked fear whereas others are less effective or ineffective?

Part of the answer lies in the selective efficacy of the visuo-motor apparatus in translating visual experiences not only into bodily responses, but also into mental states. In man (and the anthropoid apes) such emotional states can be quite prolonged and even be manifest culturally (or societally). However, they are rather unpredictable, since imitative social behavior coexists with the tendency of an individual to think and act independently. In sum, specific, transient, fear-mediated responses may at times give way to prolonged, gloomy emotional attitudes which have the potential of influencing "cultural" (i.e., a group's collective) beliefs in which the object of fear is given a symbolic role.

We may, in fact, describe an individual's emotion as a state of physiological arousal of considerable severity, with pronounced side effects that linger within a framework of cognitive capacities. Cognition, as Schacter puts it, "exerts a steering function. Cognition arising from the immediate situation as interpreted by past experience provides the framework within which one understands and labels one's feelings. It is the cognition that determines whether the state of physiological arousal will be labelled 'anger,' 'joy,' or whatever."[15] Individuals who exhibit the emotion labelled "acute fear" in the presence of a serpent differ little from those whose emotions are experimentally aroused by epinephrine, the hormone which under normal conditions is automatically secreted into the bloodstream during the state of acute fright, regardless of the cause. So specific

are the hormonal effects in the two emotions of anger and fear that, despite their normal, shared channels of activation by the nervous system, the effect produced experimentally by the hormones eliciting each emotion are just as predictable, and differ just as sharply, as under natural conditions that elicit fear or anger.[16]

A. I. Leshner cites a number of experiments with human subjects who received injections of epinephrine. Most of them reported a vague "cold" emotion or mood similar to fear. When an additional stimulus, such as a loud noise, was applied, they reported feeling more intense and genuine fear-like states. Thus, says Leshner, "emotional stimuli from the environment are necessary to the production of genuine emotional states; all that epinephrine does is to affect the intensity of those reactions . . . [an increase] in epinephrine level can potentiate emotional reactions, and emotional reactions lead to increases in epinephrine levels. It may be that [in natural situations] increases in epinephrine secretion that follow emotional experience feed back and facilitate either ongoing responses or responses in subsequent situations."[17]

Phenomena like these have much significance in a natural environment, where fear, physical pain, pleasurable sensations, or other emotions of prolonged "mood states" may be provoked by the visual stimulus emanating from an object to which a primate is unusually sensitive. The higher the anatomical development of the brain, the more complicated and unpredictable overt moody behaviors are likely to be in the different species of primates. Both apes and humans display remarkable (if different degrees of) sensitivity to models that superficially resemble natural fear-provoking objects—like sticklebacks excited by crude plaster models.

Every human society has its stock of myths that reflect the emotions and moods of the *individuals* who originally created them—emotions and moods shaped by vague fears, anxieties, and superstitious likes and dislikes of particular species of animals. Though strongly rooted in one's cultural heritage, these attitudes for the most part have little or no relevance to innate visual biases. The exceptions seem to be few, and attitudes toward certain reptiles (all serpents but not, usually, lizards) and such "creepy-crawly" creatures as spiders and frogs are among them. Now, fear- or stress-inducing visual images, registered in one's brain through the mediation of any specific (even inanimate) visual stimulus, have something in common with visions created artificially in the subconscious mind by drugs such as *ayahuasca*, psilocybin, d-lysergic acid diethylamide (LSD), and other psychedelics or hallucinogens that affect one's emotions sharply. In either situation, the physiological mechanisms that arouse terror, euphoria, depression, schizoid humor, or other such emotions or moods are identical. Thus studies which suggest that the ritual use of natural hallucinogens by priests and shamans may have been widespread in the religious practices of diverse peoples in antiquity are of much interest.[18] We shall examine the details below in relation to the societal transmission of emotional attitudes, but it is now proper to emphasize that the biological bases of such transmission cannot be appreciated except with reference to man's closest evolutionary associates.

In studying the etiology of an emotion triggered by any specific visual image, it is important to remember the many features of innate behavior common to man and the nonhuman primates. Chimpanzees, for instance, react to the visions induced by LSD with bodily symptoms identical to those observable

in man. They also exhibit "excitement, wild screaming, panic and visual hallucinations [that can be negated by] bilateral temporal lobotomy."[19] It is significant, therefore, that the *elementary patterns* of sensitivity to the serpent are similar in man and the chimpanzee; that there are extremely close correspondences at the molecular and cytogenetical levels in man, the chimpanzee, the gorilla, and the orangutan;[20] and that man retains traces of a simian system of gestural communication. These resemblances are substantiated below. There is, however, a major divergence: Ape and monkey societies are quite free from the complex cultural biases characteristic of mankind—biases which obscure the line between innate and learned fears. The advantage of studying the biological and protocultural aspects of ophidiophobia through examination of the nonhuman primates should be obvious despite this necessarily very condensed introduction.

OPHIDIOPHOBIA IN THE NONHUMAN PRIMATES

Since vision and the nervous system automatically, selectively, and jointly determine sensitivities to objects that have the potential of causing aversive behavior, the efficacy of discriminating between a normal distasteful object and one that resembles it depends upon the species. Anthropoid apes and man exhibit emotion longer and more vividly than monkeys. In addition, the repeatability of fear-mediated behaviors is subject to habituation, memory, and intelligence, while age, sex, and differences in temperament of the members of any population further complicate patterns of behavior by affecting different primate species, or societies, differently.

Ophidiophobia in man is exempt from none of these factors, though the basic features of this emotion seem to be shared by the higher primates. It is impossible to adduce "direct proof" of its inheritability, for data from experiments are nonexistent even in the case of nonhuman primates or impractical to obtain through controlled matings. Yet diverse independent pieces of information suggest that ophidiophobia is indeed not only a specific, genetically transmissible sensitivity which (like all inherited traits) may vary in degree of expression from individual to individual, but also a sensitivity that surfaces socially—sometimes under circumstances only tenuously related to actual fear of the serpent. Experiments with colonies of laboratory rats reveal that defecation and other behaviors induced by stress are a valid measure of any specific fear and that the degree of fearfulness can be intensified or diminished by inbreeding or outbreeding and, therefore, is to an important extent under the control of genetic factors that determine organic evolution and the adaptability and survivial of groups under stress.[21] Rodents are the prey of, and may avoid, serpents but can hardly be said to react to them as man and certain higher primates might. What is extraordinary about our reaction is its severity and its ontogenetic patterns; i.e., expressiveness at different stages of growth.

Macaque monkeys *(Macaca mulatta)* reared in total isolation for six months to a year soon after birth show severely aberrant behavior, and, compared with unconfined individuals raised in the laboratory in the company of other monkeys, are terrified by a greater range of objects soon after they are freed.[22] Such drastic procedures, of course, have theoretical value, but in the cases described below experimental conditions that would stifle the spontaneity of responses were carefully avoided. It is important to understand, therefore, that normal

social groups in entirely laboratory-bred colonies differ appreciably from monkeys studied either directly in their natural environment or not too long after capture. The differences, however, are in degree of expression and are not radical.

Reports of monkeys' showing fear of serpents, but rarely aggression prompted by fear, are many. In the rhesus, the symptoms include "cage shaking, cage climbing, moving to back of cage, attack posture (mouth open, head forward), fear grimace (lips retracted, teeth bared, ears flattened against head), turning of body away from object, rocking, crouching, sucking, convulsive behavior, barking, screeching, and shielding face with limbs."[23] J. Joslin and coworkers compared the responses of twenty-seven wild- and thirty-one laboratory-bred rhesus monkeys to the test object, a live serpent, under conditions designed to negate (or minimize) observational and sampling errors and possible response biases due to habituation. The emotional symptoms just listed were considered valid only if they were exhibited within sixty seconds under highly standarized conditions. To forestall any bias in judgment the observers in these experiments were kept ignorant, until the final analysis of the data, as to which of the individual monkeys were wild- and which were laboratory-born. They recorded the relative speeds ("latency score intervals") of reaction to the live serpent and to the experimental controls (models that mimicked the live serpent exactly or poorly, food, and a "nonsensical" wood block), and the absolute numbers and percentages of monkeys falling in the various categories. The results are summarized in table 5 and figure 99.

Joslin and his coworkers remark that *wild*-reared rhesus "responded more emotionally than lab-reared monkeys to the live snake . . . [showing] intense avoidance responses [to it]. About half the wild-reared monkeys showed intense avoidance responses to snake models; the rest, mild responses. Wild-reared monkeys usually showed mild responses to the sinuous tubing and practically none to straight tubing, wood block and food. Lab-reared subjects usually exhibited mild responses to the live snake and practically none to the other objects." In general, the emotional disturbances were short-lived—consistent with the lower evolutionary level of monkeys, relative to apes—and overcome by the temptation of food rewards. The results, conclude the experimenters, show that the rearing environment contributes importantly to the development of a rhesus monkey's fear of serpents.

Social conditioning, it would seem, is an important factor in avoidance behavior, since, in early life, a primate (like many other mammals) learns to respond to alarm or other emotion-betraying signals given by its parent or other adults in the social unit. These signals are analogous to oral communication in human societies. In nature, their potential usefulness in the survival of a species in the face of danger is obvious, for certain signals and their nuances could engender specific mental associations that alert an individual to the threat. In Joslin and coworkers' experiments, which were performed on one individual at a time, neither wild-reared nor laboratory-reared monkeys were responding to signals emitted by a companion—indeed, none of the laboratory-reared individuals had ever seen a serpent. Clearly, the emotional tensions of the laboratory-reared individuals must reflect an innate response to serpents that is independent of learning experience and memory.[24] It is equally clear that the wild rhesus—some of which may have seen serpents in their native haunts in

TABLE 5. FREQUENCY DISTRIBUTION OF THE LATENCY SCORES OF THE REACHING RESPONSE IN LAB- AND WILD-REARED MONKEYS

	LATENCY SCORE INTERVAL (IN SECONDS)														MEDIAN LATENCY SCORES OF THE REACHING RESPONSE (IN SECONDS)	
	0–9.9		10.0–19.9		20.0–29.9		30.0–39.9		40.0–49.9		50.0–59.9		60.0–		WILD-REARED $N = 27$	LAB-REARED $N = 31$
	W[a]	L[b]	W	L	W	L	W	L	W	L	W	L	W	L		
Live serpent (62 cm.)	4[c]	22	1	3	1	2	1	0	0	1	0	0	20	3[c]	60.0[a]	5.3[a]
Lifelike model (sinuous)	12	27	1	2	0	0	1	0	0	0	0	0	13	2	33.6[a]	3.0[a]
Lifelike model (straight)	9	29	1	0	0	1	0	0	0	0	2	0	15	1	60.0[a]	2.9[a]
Brown model (sinuous)	10	30	1	0	1	0	0	0	1	0	0	0	14	1	60.0[a]	3.0[a]
Straw model (sinuous)	11	31	1	0	1	0	1	0	0	0	0	0	13	0	30.0[a]	2.9[a]
Sinuous tube (black rubber)	19	30	0	0	1	0	2	0	0	0	0	0	5	1	4.3[a]	2.9[a]
Straight tube (black rubber)	22	29	2	2	0	0	1	0	0	0	0	0	2	0	3.4	2.7
Wood block	25	31	0	0	1	0	0	0	0	0	0	0	1	0	2.8	2.5
Food	27	31	0	0	0	0	0	0	0	0	0	0	0	0	3.0	2.5

SOURCE: Joslin, Fletcher, and Emlen, "A Comparison of the Responses to Snakes of Lab- and Wild-reared Monkeys," table I.

[a] The number of wild-reared subjects whose latency scores fell within this interval for the test object.

[b] The number of lab-reared subjects whose latency scores fell within the same interval for the given test object.

[c] Distinctly "deviant" individuals.

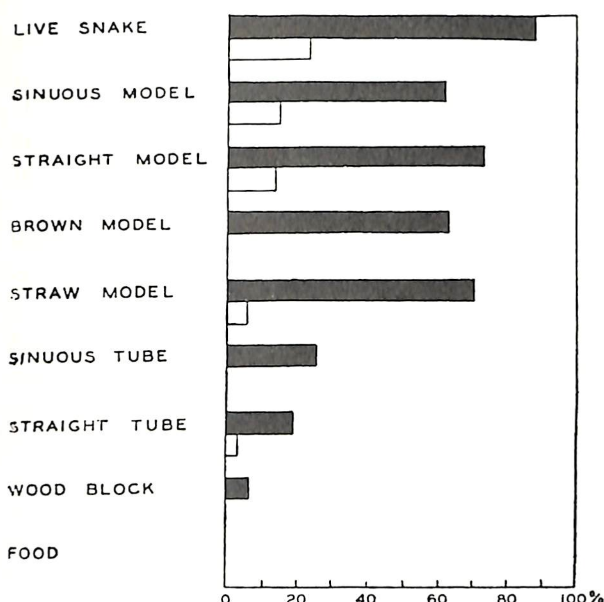


Fig. 99. Percentage of rhesus monkeys emotionally upset at the sight of a live serpent and other objects. Black bars represent wild-reared and white bars laboratory-reared monkeys.

India or at least lived in groups possessing the potential of responding to the appropriate alarm signal—were spontaneous in exhibiting their intense emotional reactions in these experiments.

Observations of another species of macaque, *Macaca sinica*, strongly suggest the high survival value of social conditioning in its natural environment with reference to selective sensitivities to the color patterns and sizes of certain serpents. W. F. P. J. Dittus's extended field observations of these monkeys reveal that their "response to the python, *Python molurus pimbura*, and the poisonous snakes, cobra, *Naja n. naja*, and Russell's viper, *Vipera russelli pilchella*, was one of alarm, avoidance, and curiosity. . . . Nonpoisonous snakes did not elicit these responses."[25] How ingrained is such behavior in nonhuman primates as a whole? Since environmental stresses and the innate constituents of fear (whatever the stimulus) interact constantly in all primate communities but vary in expression in different species, it is logical to note some of the patterns of fear in a few representative genera.

The lemurs are evolutionarily the lowest-ranking prosimians of the superfamily Lemuroidea and far less intelligent than macaques. Lemurs are native to the island of Madagascar, which is devoid of truly venomous serpents. A species of boa constrictor inhabits the forests and is known to feed on small mammals such as ground squirrels. Though a potential predator, it poses no serious threat to the lemurs. Field reports, which conclude that "*Lemur catta* are not instinctively afraid of serpents," describe an actual confrontation involving a common variety of serpent and a small troop of lemurs, none of which was perturbed by its presence in their midst. Indeed, a female lemur ventured towards it to within a distance of about a meter. Nor did they seem to be afraid of parrots, bats, or

beetles. In contrast, the lemur's natural, though occasional, predator, the harrier hawk, provoked agitated shrieks, loud barks, and chattering vocalizations of a kind heard on no other occasion. The lemurs also swung their tails, urinated, and defecated whenever this hawk came nearby, but none of these reactions occurred when a quite different, harmless species of hawk and various other large birds were sighted.[26]

Lemurs are poor learners, but the behavior just described shows that they have evolved the basic characteristics of primate societies without the object-learning skills or manipulative ability that typifies the higher primates. The lemuroids seem to have acquired much of their social behavior towards food and other species, including predators, in small part through innate recognition patterns (and perhaps least from encounters with a predator, since pressure from this quarter is so low) but mostly by taking their cues from other members of the troop.[27] Social conditioning no doubt molds primate behavior importantly, even the primitive lemur's, but one should guard against undue emphasis on this factor, since the tendency to display ophidiophobia becomes increasingly apparent as one ascends the evolutionary scale from lemur and monkey to ape and man.

Squirrel monkeys *(Saimiri sciureus)*—which inhabit South America and are quite unrelated to the Asian macaques—are by no means outstandingly superior to prosimians in their learning abilities. Their level of performance in simple tests of retention of acquired, discriminative actions is low and in multiple discrimination tests is hardly better than that of control groups of the same species trained to tackle a single problem.[28] Despite these inadequacies, their sensitivity to serpents (even motionless ones) is remarkable—to the extent that it is manifest even when severe handicaps are imposed to inhibit its expression. D. M. Rumbaugh's experiments show that, normally, squirrel monkeys are quite inept at looking through large Plexiglas-fronted glass jars and fail to discriminate between the contents of different jars during the six chances usually allowed for solving each problem put to them. Nevertheless,

> they detect *immediately* whether a jar is empty or whether there is a snake within. This sensitivity is so marked and so resistant to extinction, with the fear evidenced in response to jar plus snake not generalizing readily to empty jars, that we have used it as a test situation to determine recovery levels of squirrel monkeys subsequent to exposure to near-vacuum atmospheric pressures. The etiology of such fear is not known to us but we are inclined to agree . . . that it is probably easier to condition fear within primates to certain classes of objects or environments and that snakes might possess certain qualities that make them prepotent as stimuli to which fear can be readily conditioned. In my judgment, the squirrel monkey is an excellent candidate for studies of the origins of fears and the effects of fear upon instrumental and social responses.[29]

Just as rhesus monkeys in Joslin's experiments were afraid of sinuous black rubber tubing, so also squirrel monkeys, and also marmosets *(Leontideus rosalia)*, according to Rumbaugh, screech, turn away, or withdraw in fear when certain types of wire cable are shown to them. The extent to which these attitudes reflect memories linked to predator pressure in their jungle environment is not clear. Squirrel monkeys are predominently an arboreal species that live in large

numbers, relatively unmolested, though an occasional predator eagle or a large boa constrictor may prey on them.

T. T. Struhsaker's tape-recordings of oral communication among African *Cercopithecus* (guenons or vervets) reveal their large repertoire of vocalizations, seemingly recognized by all members of the genus. They possess an interesting pattern of calls including not only air-raid and ground alarms, emitted in the presence of hawks and minor mammalian predators, but also a specific "snake chutter." It is voiced primarily, if not exclusively, by adult females and juveniles and directed towards two venomous species of serpents,the puff adder *(Bitis arietans)* and the cobra *(Naja haje)*. This "chutter" is emitted in a peculiar way, with several vervets clustering in the vicinity of these serpents and following them as they wind through the thicket. Struhsaker notes that this peculiar behavior, which perhaps reflects a combination of fear, alarm, and cautious aggression, was not evoked by at least three other (unidentified) species of serpents observed in the vervets' habitat. The low-amplitude characteristic of this alarm signal, says Struhsaker, may be adaptive in the sense that "it effectively warns other vervets, who might be within the relatively short striking distance of the snakes, without attracting the attention of other predators, as might occur with a call of higher amplitude."[30] Thus, the "snake chutter" and its associated behavior seem to be adaptations evolved particularly against cobras and vipers.

Whether or not different species of nonhuman primates evolutionarily more advanced than the prosimians and monkeys can distinguish between venomous and nonvenomous serpents in their particular localities is not known with certainty. The basis for this ability, however, does exist, for the visual sensitivities of primates are generally sharp, and the colors and markings of the various species of serpents are quite distinctive. Anthropoid apes in particular show a pronounced aversion to all species, venomous or not.

In these contexts, the factor of predator pressure is important in view of its possible influence on the origin and development of ophidiophobia. Most primatologists agree that predator pressure is low to the point of being almost insignificant in all primate populations. The great apes, in particular appear to be quite free from molesters other than man.[31] Deaths, except those due to old age and disease, seem more often the result of accidental falls from treetops than of attacks by other animals. The Japanese macaques do not have even potential predators. Young stumptail macaques showed no fear of a leopard to which they were exposed in a zoo in Assam, a part of India in which leopards are natural predators of many species of monkeys, including macaques.[32] According to Alison Jolly, the hyena, leopard, and lion, though common in the particular region of Africa she studied, were potential rather than real threats to primates.[33] Most African studies[34] show that the principal enemy of the baboon *(Papio ursinus)* is the leopard, and occasionally the lion, rather than the python or other serpents. Niels Bolwig's studies of the behavior of baboons both in the laboratory and in nature indicate that these ferociously aggressive individuals "seem to have an innate fear of snakes or other cylindrical objects which can bend and wiggle. Towards other animals which do not serve as food, they normally show indifference . . . on occasion juveniles take pleasure in teasing other animals [such as] kudu and lions."[35]

These representative cases suggest that predation is not the simple, direct cause of sensitivities of the kind displayed by squirrel monkeys, macaques, vervets, and baboons. Since there are no truly venomous serpents in Madagascar and no other serious predatory pressures from other species on the primitive lemurs there, it is difficult to ascertain whether the lemur's apparent lack of ophidiophobia is related to poor neural development alone or to ecology. Monkeys, on the other hand, are anatomically more advanced than the Lemuroidea and other prosimians but considerably less so than the anthropoid apes. Yet, in their mainland African habitats, monkeys show remarkable sensitivity to serpents, though the latter exert no significant predatory pressure on them. This suggests that in biological evolution, perhaps in very early Miocene times, ca. 25 million years B.P., ophidiophobia may have originated in the Proto-Simiae, the primitive, extinct stocks from which all present-day genera of platyrrhine and catarrhine monkeys have descended.

In incipience, this emotion could have been little more than a mild, "nervous" reaction occasioned by mere serpentine bodily form and sinous movement that foreshadowed an attack. Venomous bites and predacity were certainly apt to become increasingly important as reinforcing events[36] through natural selection in the direction of enhanced responses involving avoidance behavior and alarm calls. This may have occurred during phylogenetic differentiation of the superfamilies Ceboidea and Cercopithecoidea. Their achievement of effective visuo-motor stimulation cannot be doubted in this respect.

Basically, "all brains of primates seem to be models of each other. In fact, no new structure *per se* is found in man's brain that is not found in the brain of other primates." The differences, according to C. B. G. Campbell, are subtle and expressed quantitatively and behaviorally inasmuch as they reflect varying degrees of development of discrete functions and structural areas of the brain. The generally poor visual acuity of the squirrel monkey, for example, is in part due to fewer synaptic relays in the retinogeniculostriate cortex pathway, a lack of Brodmann's Area 19 in its relatively small brain, and a generally inferior color discrimination and sensitivity to certain wavelengths of light as compared with the vision of the rhesus. Nevertheless, though squirrel monkeys are among the most primitive of monkeys, they are extraordinarily sensitive to the presence of serpents, as is evident from Rumbaugh's experiments. There are obvious differences between two subfamilies of monkeys, the Cercopithecinae and the Colobinae, and also subtler differences between their constituent genera in regard to the patterns of their brain sulci (furrows or grooves). They differ in several areas of the cerebral cortex, particularly the fronto-orbital cortex and the inferior temporal gyrus, structures that are importantly involved in visual pattern discrimination. The neurons in the inferotemporal cortex, according to Snodderly, have "very complicated stimulus requirements for forms that approach the shapes of natural objects rather than simple geometrical figures. . . . This region of the brain is critical for normal visual learning and it may participate in the storage of visual memories."[37]

Differences in details such as these are intimately related to variations in visual processing, learning, long-term memory, and discrimination between shapes, sizes, and colors. Prosimians like the lemur have relatively few (or no) cerebral cortical sulci, in contrast to anthropoids. Similarly, it is likely that deficiencies or variations in brain structure in nonhuman primates interfere with

their potentials for accurately discriminating between live serpents, toy rubber models, and rubber tubes, i.e., that these deficiencies impel them to display their emotions indiscriminately. Indeed, neuroses have been produced experimentally by simply placing toy rubber serpents in monkeys' food boxes. The species responses were clear-cut: mangabeys and spider monkeys were more vulnerable than vervets and rhesus; in addition, the younger animals in each case were more susceptible than the older. Other factors that sharpen neurotigenesis (perhaps paralleled in nature?) include repetition of the traumatic experience at unexpectedly long intervals, representational reinforcement, and a diminution of adaptive capacities produced by cerebral lesions.[38]

Thus, fossil monkey endocasts provide an important clue to brain structure. *Micropithecus*, the oldest fossil cercopithecoid specimen available for study, dated to about 9 million years B.P., is similar to the 6-million-year-old *Libypithecus;* moreover, it is remarkable in that it exhibits the typical modern colobine monkey sulcul pattern. This feature, therefore, represents a primitive condition that certainly had evolved at least 9, perhaps even 15 million years ago.[39] Now, the Oligocene fossil primate *Aegyptopithecus*, believed to be the oldest known common ancestor of man and apes, extends no farther back than about 30 million years. The first truly manlike forms are represented by hominoid fragments of *Ramapithecus* and *Kenyapithecus*. They appear in the fossil record in the Miocene-Pliocene periods, at least 14 million years ago. Thus, it would seem that the genetic and neuroanatomical foundations of rudimentary visuo-motor mechanisms of ophidiophobia in the individual (and its attendant social repercussions) were differentiating steadily in the higher primates well after the origin of venomous species of serpents.[40]

In the tropics, the scene of all these developments, serpents were in all probability a potential threat (especially to the smaller individuals) and must have prompted the acquisition (through mutation and natural selection) of peculiarities now recognizable as social defense mechanisms in several genera of the primates. The quintessential features must surely have been in operation in their gregarious communities—perhaps more efficiently than was warranted by actual predatory pressure—long before the evolution of the anthropoid apes.

The ophidiophobia of the latter is of special interest because they are anatomically and psychologically the most closely related to man. The gorilla's fear of serpents is well documented. Shortly after their capture, individuals of one batch have been described as nervously refusing to enter a section of an enclosure, because, it was later found, a serpent resided there. The personality of Toto, a gorilla captured when she was only two months old and raised in an American home as a family member, is equally revealing. Often unmanageable in adulthood, she also had a deep fear of serpents. Her keeper could extract obedience from her only by exhibiting one of several serpents kept expressly for this purpose.[41]

The information provided by the chimpanzee, which has been more intensively studied in its habitat than the gorilla, is more directly relevant to human ophidiophobia. Moreover, its endocrinological, anatomical, and other close resemblances to man make it the experimental animal of choice when investigating human psychological development and behavior correlated to growth and maturation. Both chimpanzee and man have a prolonged infancy, an exuberant childhood, and, during maturity, a decline in overt activity along with increased

differences in temperament related to sex. In formal behavior tests, certain chimpanzee performances improve with age and others decline. The declines manifest themselves in early maturity, as in humans.[42]

Robert M. Yerkes's investigations of chimpanzees show that

> In infancy or early childhood there is slight indication of specific fear of serpents and tortoises though responses may be cautious, some individuals persistently avoiding contact with them. But this is common in the face of any unfamiliar object. Adult apes, in the presence of snake or tortoise [with its snakelike neck and head] are either hostilely aggressive or stirred to excitement, retreat or flight. Jack, a large adult born in Africa but for several years a captive, on seeing a tortoise promptly retreated and hid from it, and later, when the harmless animal approached him, screamed shrilly and climbed out of the way. That this behavior in the adult ape is no ordinary object response is conclusively proved by our often demonstrated ability to drive a refractory individual into a restraining cage simply by presenting a tortoise or snake.

Extreme fear often produced violent responses of the bowels and circulatory and respiratory systems.[43] That fear of the serpent is not necessarily acquired by "social conditioning" or imitative behavior is clear from studies of chimpanzees reared in isolation.[44]

One of the most convincing theoretical analyses and series of experiments on the psychologically innate constituents of complex responses of chimpanzees to visual stimuli is that of P. Schiller:[45]

> Almost all adult chimpanzees show marked fear of snakes. This is not true of infants, and the fear is more persistent in older adults than in youngsters. The origin of this fear is not known but, if it has an instinctive element, this should be revealed by differences in the rate of formation of approach and avoiding reactions to snakes and to other visual objects which never normally elicit such fears. Two experiments were carried out to test such differential learning.
>
> 1. Two infant chimpanzees about two years of age were used in this experiment. They had been kept in darkness for the first year or more of life and thereafter in separate cages, so that their experiences were extremely limited. They were trained in discrimination between a whole orange and a dead, coiled coral snake, each in a glass jar. Neither animal had ever seen a whole orange (they are fed small pieces) or a snake. They were trained to touch the positive jar, with reward of milk from a bottle, and to avoid the negative with electric shock or later a gentle push as punishment. Training was continued to 45 of 50 trials correct. For animal S the snake was first positive; for animal A, the orange. Training was then reversed (Table [6], experiment II) and for animal A reversed a second and third time (experiments III and IV). As shown in Table [6], there is no significant difference in the rates of acquisition of reactions to objects which do, or do not at a later age call out marked fear reactions.
>
> 2. A second experiment was devised to test whether the fear reaction, once established, by maturation or learning, is more difficult to change by conditioning than is a positive or indifferent reaction. Fifty-two chimpanzees, ranging from 1 year to 30 years of age, were stimulated repeatedly by the presentation of live, moving snakes confined in a glass box. Thirty-four animals consistently displayed avoidance reactions, with definite inhibition of locomotion, specific vocalization, and fixed gaze from a safe distance. No fear, but interest, approach, exploration up to touching and licking the glass box that contained the live snake clearly visible was found

TABLE 6. NUMBER OF TRIALS AND ERRORS NECESSARY TO MAKE A RELIABLE DISCRIMINATION

CHIMPANZEE	SNAKE + TRIALS	ORANGE − ERRORS	SNAKE − TRIALS	ORANGE + ERRORS
S.	I. 732	247	II. 706	278
A.	II. 323	132	I. 255	93
A.	IV. 243	85	III. 302	127
Average	433	155	421	166

SOURCE: Schiller, "Innate Constituents of Complex Responses in Primates," table 1.

in 18 animals. Of these, 10 were infants under 3 years who all "kissed" the glass where the snake kept moving; 5 were immature animals of both sexes, 3 were old adult females. In the fear-exhibiting group, on the other hand, there was no infant, 12 were immature and 22 were adult animals of both sexes. There is thus some indication that fear of the snake grows with age. The fear is quiet specific and is not elicited by lizards, toads, or large insects shown under the same conditions. After the initial tests of reactions, a series of training tests on the 32 animals which showed fear reactions was conducted as follows: A snake in a glass box with glass cover on which was placed a piece of banana was presented before the cage and left until the banana was taken. The box was then presented without food, and any fear reactions were recorded. Training and test presentations were alternated for 14 trials. Table [7] shows the number of animals that did not show fear reactions in the test presentations but responded by approaching and even touching the box. Twelve trials were sufficient to abolish the fear reaction in all but two of the 32 animals.

In a complementary experiment a banana was placed in the same glass box. The box was arranged with a wire cover which could be charged so that the animal received a shock if he touched a piece of food placed on the cover. Table [8] shows that the positive reaction to the food in this situation was extinguished in 8 trials in all the subjects.

There is no significant difference in the amount of training required to extinguish the fear reaction to the snake and the positive reaction to the banana. Since the banana is not native to the chimpanzee's habitat, responses to it are certainly not innately determined. . . . Systematic reinforcement of selected motor sequences in the course of early life could show the limits of building up and generalizing stereotyped series. The framework of adaptability cannot be seen without prolonged experimentation, for an animal usually inherits not only his organism but also the environment in which he lives.

Schiller's work on the visuo-motor aspects of chimpanzee psychology set the stage for many subsequent important observations. It showed beyond doubt that the motor components of visually stimulated primate behaviors are—as in

TABLE 7. NUMBER OF APES DISPLAYING FEAR OF SNAKE AFTER TRIALS ASSOCIATING SNAKE WITH FOOD

BEFORE COND'G	AFTER 2,	4,	6,	8,	10,	12,	14 TRIALS
32	25	19	14	9	5	2	2

SOURCE: Schiller, "Innate Constituents of Complex Responses in Primates," table 2.

TABLE 8. NUMBER OF APES (of 8) AVOIDING THE PRESENTED FOOD AFTER TRIALS OF PUNISHMENT FOR TOUCHING FOOD

BEFORE COND'G	AFTER 2,	4,	6,	8,	10 TRIALS
0	3	5	7	8	8

SOURCE: Schiller, "Innate Constituents of Complex Responses in Primates," table 3.

lower organisms—innately determined, that these motor responses are the basic units of overt behavior, and that adaptive behavior is constituted of unlearned patterns which are subject to modification by repetition or reinforcement. That is to say, though very young chimpanzees are generally devoid of innate, specific fear of serpents, a pattern of sensitivity develops spontaneously as they mature into young adults; hence, it must have a basis in latent genetic expressivity; further, extraneous factors may influence the repeatability or extinction of rudimentary expressions of developed ophidiophobia.

"Normally" raised juveniles, i.e., both laboratory-born and wild chimpanzees reared by their mothers in "normal" fashion for the first year or two of their lives, in the laboratory never display the strong and pervasive nervousness towards some of the many strange objects that always affect the adult. The normal infant chimpanzee, as the recent observations of E. W. Menzel, Jr., R. K. Davenport, and C. M. Rogers confirm, starts out overbold and only in later years acquires many of its fears of specific classes of objects, such as serpents, strangers, and perhaps potentially predatory mammals. Precisely why these changes in psychological makeup occur is not known. The explanations of this are in any event less relevant than the fact that these fears seem to arise spontaneously from generation to generation in predictable age-related patterns, for none of the individual chimpanzees tested had had any previous exposure to specific fear-inducing situations. Thus it appears that these fears are not transmitted in the same way that chimpanzees transmit their other social habits. In other words, a young chimpanzee does not learn about or acquire the specific fear of serpents, or other shocking encounter, from adult chimpanzees by any mechanism classifiable as social communication.[46]

However, the experiments of Menzel, Davenport, and Rogers (my italics)

> suggest that even "simple" and "instinctive" behaviors are influenced by culture-like processes . . . that a given response to a novel object can be passed along several "social generations," *even after the original instigators of the change in response are no longer present.* The data are of special interest because most of the individuals involved had been reared with extremely limited social and object experience, and by comparison with wild-born controls were grossly retarded in social behavior and learning performance. *Thus some forms of tradition and culture might not require even normal chimpanzee intelligence.*

These researchers believe that "culture-like phenomena are much more widespread than previously thought" and that "air-tight theoretical dichotomies between learning and instinct, and cultural and individual learning are invalid." They do not imply that "chimpanzee protocultural behavior is necessarily acquired in the same fashion as are human culturally-determined attitudes towards objects and events." Nevertheless, they regard "attempts to define

cultural phenomena as only those behaviors which are transmitted by specifically humanoid means such as oral and/or written language, or by symbolism, as overly restrictive." These views are based on groups of chimpanzees, rather than on isolated or socially deprived individuals. They do not warrant the assumption that chimpanzees may not be able to transmit group or individually acquired, or innate, but socially conditioned, responses owing to a lack of faculties usually regarded as typically human.

The information given so far is significant for three reasons: First, the *basic* intelligence and learning-discrimination ability of the chimpanzee, as shown by Rumbaugh,[47] are comparable with those of the other great apes and by some criteria even the macaque's and the squirrel monkey's. Second, in *innovative* intelligence the chimpanzee (and other apes, but less so the gibbon) is markedly superior to all monkeys, while also closely resembling humans in the anatomical structure of the brain. In concept-discrimination problems, for instance, the chimpanzee compares very favorably with human children of equivalent age.[48] Third, the chronological pattern of development and intensity of specific fears, particularly that of the serpent, are remarkably similar in chimpanzees and humans. This similarity is extraordinary in that it becomes manifest as a stage in psychological development only about three years after the termination of another trend that normally prevails during the first eighteen months of life. This is known as the "sensorimotor period," following Piaget, who first demonstrated the precisely orderly sequence of acquisition of increasingly complex cognitive capacities by the human child. An instrument and scales for assessing visuo-motor capacities in relation to the physical environment during this period have only recently been developed. As the "sensorimotor period" wanes, divergences become increasingly apparent, and infants exhibit the behavioral trends characteristic of their own species. Thus it is remarkable that, as they grow, human, chimpanzee, and gorilla infants exhibit minor qualitative differences but very close chronological similarities in the order, rate of achieving the sequences, and certain details of behavior dependent upon visual acuity.[49]

OPHIDIOPHOBIA IN THE HUMAN PRIMATE

H. E. and M. C. Jones showed many years ago that humans and chimpanzees never previously exposed to serpents reacted in much the same way. Their human subjects were told in advance that the reptile they were soon to see was a torpid, harmless one. Neither one-year-old chimpanzees nor young children up to age five exhibited any fear, but fear became increasingly severe in older children and adolescents to the extent of producing caution mixed with morbid curiosity. Most adults, both young and mature, avoided the reptile revulsively, in horror. Likewise, adult laboratory-reared chimpanzees, who had never before seen a serpent, "were disturbed, very much so, their reactions being about as strong as a man's."[50]

That susceptibility to fears and phobias in general undergoes changes correlated with age is disclosed by a number of studies.[51] Very young children have extensive fears, but the majority of these undergo a steady, natural decline in intensity and frequency. The fear of darkness and ghosts, for instance, is strong in many five-year-olds but seems to wane drastically by age seven. Michel Zlotowicz, who describes general and specific fears in French children, found

that most two-year-old children respond fearfully to loud noises and to events linked to specific noises, whereas only a minority of six-year-old children are fearful. The latter are more prone to fear imaginary situations.

A pronounced fear of animals in general has been noted in several surveys. A. Maurer's study of 500 American schoolchildren aged between 5½ and 14½ reveals that "they do not fear the things they have been taught to be careful about: street traffic and germs. The strange truth," she observes, "is that they fear an unrealistic source of danger in our urban civilization: wild animals." This was the *sole* category mentioned by the children (in the course of the Wechsler test) in 64 percent of the total responses to the question "What are the things to be afraid of?" asked in a neutral tone to forestall defensive answers to other forms of questioning. In the replies of 5- and 6-year-olds (who also named other fears such as darkness and ghosts), 80 percent named one or more wild animals, with the serpent, "the most unpopular" of these, predominating (30 percent), followed in order of fearsomeness by the lion (25.8 percent), the tiger (12.5 percent), the bear (8 percent), and 34 other, less frequently mentioned animals. It is possible that these fears in some cases were sheer fantasies, augmented or nurtured by the child's social upbringing, including comic strips, television, and visits to zoos. This, however, hardly applies in the case of the chimpanzee, whose chronological development of ophidiophobia parallels the human situation markedly.

Maurer's finding that the serpent was the most disliked animal (complemented by Stanley Rachman's surveys, which classify fear of it as generally "acute") is also important for another reason: The fear of wild animals in general declined steadily from a frequency of 80 percent in 5–6-year-old children to 73 percent, 68 percent, 61 percent, and 23 percent in 7–8, 9–10, 11–12, and 13–14-year-old children, respectively.[52] Thus, despite the general decline among older children of neurotic fears of practically all other animals, the intensity of ophidiophobia shows a precisely opposite ontogenetic tendency. Very young chimpanzees and humans, as we have noted above, are alike in that they are devoid of ophidiophobia but acquire it naturally at about age five.

R. C. Kornhaber and H. E. Schroeder screened second- and third-grade American schoolchildren, aged seven to eight years, for fear of serpents on the basis of their reactions to sets of multiple pictures of various animals. Among those depicted were representatives of different zoological levels, including various insects, the frog, the lizard, the alligator, the serpent, the beaver, and the panther. The pictures were shown to each child privately, with questions such as "Which animal do you like?" and "Which animal don't you like?" asked blandly so as not to influence the answers. The scores on this attitude test were determined by the number of pictures of serpents liked by a child minus the number of serpent pictures disliked, the range of possible scores being +10 to −10. A positive score was interpreted as a tendency to prefer serpent pictures, a negative one as indicating dislike. Two weeks later, a behavioral avoidance test was administered individually to the chidren in order to assess their actual fear of serpents, the creature in this instance being a live boa 1.05 meter in length. Each child was asked to approach it from a distance of 2.7 meters. Encouraging remarks were made to them from a tape-recording of the teacher's voice (to ensure uniformity of experimental conditions), the test finally requiring the child to hold the reptile with bare hands for about a minute, refusal to do so being

adjudged a failure in the test. Of the seventy-eight children, fifty (i.e., 64 percent) were unable to touch the boa even with a gloved hand.[53]

Cultural anthropologists and psychologists have long utilized drawings, by children (and adults) of both advanced and nonliterate societies, as indices of self-expression in a culture or the personal attitudes of its members. Ruth Griffiths, utilizing drawings, ink-blot tests, stories invented, and dreams, has analyzed numerous cases of normal children from London and Brisbane, mostly five-year-olds, who *fantasized* situations of terror. In these, she reports, serpents (and even a "wolf-snake" hybrid), spiders, and sometimes biting dogs are the animals that occur most frequently in contexts of anxiety or death.[54] The responses of six- to twelve-year-old American schoolchildren, evaluated by Elizabeth M. Koppitz, were quite similar. Though she had explicitly requested drawings of human figures, several children drew animals as ancillary subjects. Except for a swordfish, a "wolfman," and humanoid monsters, they included only a "sea-serpent," "dangerous, biting, poisonous snakes," a "two-headed dragon," and a "poisonous lizard."[55] Bulgarian schoolchildren four to eight years old differ in their perception of serpents. Inspired by visits to museums or by pictures seen in books, urban children (in Sofia) tend to stereotype them and draw simple, sinuous forms. In rural Bulgaria, where vipers are quite common and the objects of an annual domestic expurgatory ritual, the children tend to give them imaginative forms, for example, by delimiting a "poison-containing spot" on the tail or endowing them with four feet.[56]

These examples from advanced societies have a parallel in at least one primitive society, the Papuanoid tribes of Alor, one of the Lesser Sunda Islands in the Savu Sea, Indonesia. Cora Du Bois, who studied development of their personality structure, found that the serpent (followed by hawk and chicken) easily topped the list of twenty-two animals most frequently envisioned by six- to sixteen-year-old Alorese children asked to make pencil sketches of any subject they chose to portray. This may not be unexpected, since serpents are common in Alor and considered loathsome. What is noteworthy is that snails and walking-stick insects, which "like the serpent produce shudders of revulsion," figured very rarely in these drawings. Yet, it is remarkable that eels, though they are the subjects of drawings and dreams, evoke no revulsion despite their serpent-like form and size. Caterpillars do not figure in the drawings, but one person who dreamt of them is reported to have been frightened because they reminded him of serpents. Du Bois singles out the latter, but no other animal, in her tabulations of *rank order* of preferred items in drawings that reflect the Alorese child's basic preoccupations. Unfortunately, her documentation is not as detailed as Maurer's or Griffiths's though, as far as I know, the subject of children's attitudes towards animals has not been investigated along similar lines in other primitive societies.[57]

It would hardly be surprising—whether in rural societies facing realistic threats from reptiles or in highly advanced urban ones unaffected by them—if the markedly spontaneous ophidiophobic tendency of childhood were to continue into adulthood, partly because of peer-group or parental influence. Modern case studies suggest, however, that this factor is absent or quite minor. Clinical psychological literature is replete with descriptions of severe neurotic anxieties and fears of many college students and urban adults who had participated in tests involving exposure to, or even mere mention of, serpents, and

TABLE 9. MEANS AND STANDARD DEVIATIONS OF IMAGERY RATINGS

FEAR SURVEY SCHEDULE SCENE	X̄	SD
1. Sharp objects	6.147	1.286
2. Being a passenger in a car	5.594	1.662
3. Dead bodies	5.494	1.857
4. Suffocating	4.188	1.982
5. Failing a test	5.000	1.764
6. Looking foolish	4.710	1.801
7. Being a passenger in an airplane	5.135	1.997
*8. Worms	6.041	1.390
9. Arguing with parents	4.700	1.912
*10. Rats and mice	5.899	1.562
11. Life after death	3.249	2.041
12. Hypodermic needles	5.924	1.519
13. Being criticized	4.435	1.781
14. Meeting someone for the first time	4.876	1.787
15. Roller coasters	5.729	1.712
16. Being alone	5.212	1.748
17. Making mistakes	4.565	1.820
18. Being misunderstood	4.371	1.823
19. Death	4.506	2.187
20. Being in a fight	4.271	2.011
21. Crowded places	5.871	1.299
22. Blood	5.906	1.559
23. Heights	5.588	1.691
24. Being a leader	4.512	1.798
25. Swimming alone	4.924	1.991
26. Illness	4.412	1.838
27. Being with drunks	4.988	2.003
28. Illness or injury to loved ones	5.147	1.861
29. Being self-conscious	4.882	1.721
30. Driving a car	6.224	1.313
31. Meeting authority	4.641	1.829
32. Mental illness	3.294	1.739
33. Closed places	4.329	1.936
34. Boating	5.794	1.526
*35. Spiders	6.206	1.300
36. Thunderstorms	6.459	1.009
37. Not being a success	3.618	1.791
38. God	4.300	2.269
*39. Snakes	6.341	1.192
40. Cemeteries	6.312	1.203
41. Speaking before a group	5.247	1.572
42. Seeing a fight	4.888	1.711
43. Death of a loved one	4.776	2.005
44. Dark places	5.006	1.749
*45. Strange dogs	4.618	1.931
46. Deep water	5.465	1.781
47. Being with a member of the opposite sex	6.329	1.165
*48. Stinging insects	5.753	1.511
49. Untimely or early death	4.171	2.041
50. Losing a job	3.641	1.954
51. Auto accidents	4.988	1.884

SOURCE: Wilkins, "Imagery Values of Fear Items," table 2.
NOTE: The asterisks call attention to animal items.

sometimes spiders. In fact, the former is commonly used in investigations into the nature of elementary fear. The Snake Attitude Questionnaire,[58] the Geer Fear Survey Schedule[59] (with categories like "terror" and "very much fear"), the anxiety-determination tests that differentiate between general and specific fears (e.g., State-Trait Anxiety Inventory, Taylor's Manifest Anxiety Scale, the neuroticism scale of the Eysenck Personality Inventory), and other testing devices justify the serious attention psychologists have given to ophidiophobia as a deep-seated specific fear.

A survey by W. Wilkins[60] reveals the dimensions of ophidiophobia vis-à-vis other tensions incited by objects or situations that can arouse physical pain or anxiety. Using 170 American college students as test subjects, he devised an experiment to determine quantitatively under strictly controlled conditions the ease or difficulty with which certain words or phrases evoke mental images in these subjects. He chose fifty-one items for this purpose. Of these, thirteen were modifications of the nouns and phrases from Geer Fear Survey Schedule II and the remaining thirty-eight (nonfear) items from a separate list of 925 nouns used in quantitative assessments of image-evoking potentials formulated by A. Paivio and coworkers,[61] whose experiments did not focus on fear. Their list of 925 nouns included twenty animals, including "snake," which, they discovered, could excel all the others (even scorpion, leopard, and elephant) by scoring 6.90 on a scale of 7. It is proper, therefore, that Wilkins selected "snakes" and a few other animal species for use in his own list. The responses of his college students—signifying the degree of arousal of fearsome mental imagery manifest either as mental picture, sound, or other imagined sensory experience—were rated for each item as "none," "very little," "some," "much," "very much," or "terror," also on a scale of 7. Table 9 shows the random order of presentation of the fifty-one items and the corresponding responses. It is noteworthy that although a number of common tension- or anxiety-inducing objects and situations (some of them both realistic and serious in American society) occur alongside fear-inducing items, "snakes" once again surpassed all except "thunderstorms."

How insidiously ophidiophobia lurks in modern urban populations may be gauged from the volume of psychological literature annually indexed specifically under that subject heading in *Psychological Abstracts*. I summarize below four cases relevant to our theme of subconscious mental images prior to integrating our information on nonhuman and human primates in wider, psychobiological contexts:

A random sample of seventy-six American college girls was initially given two types of tests, some of which gauged general and others specific anxieties. Afterward, each girl was exposed to three different situations involving potentials of inducing fear. Their behavioral responses in measured experiments and other ratings showed that specific tests were "clearly superior" to general ones in predicting fear of serpents but only slightly superior in predicting other specific fears such as that of darkness and of heights.[62]

An ophidiophobic woman and a spider-phobic woman, successfully desensitized psychiatrically, were eventually asked to approach and handle a caged serpent (or spider) as in the normal behavioral approach test and also subjected to the sight of the same animals, this time uncaged. Each woman was found to give way to substantially greater physiological and cognitive distress while merely looking at the uncaged animal from a distance of 9.12 meters than while

actually touching the caged animal. Although both women were able to touch the caged serpent or spider, they reported persistent inability to overcome other inhibitions that were linked to their phobias before they received desensitizing treatment.[63]

Desensitization experiments were conducted with individuals from Oregon, who had responded to a newspaper advertisement offering clinical treatment to those who were "truly terrified of snakes." Only those respondents were selected who met all of the following criteria: refused to touch a tame 1.2-meter-long boa securely enclosed in a glass cage; scored 19 or more on a standard snake attitude questionnaire; registered "very much fear" or "terror" on the snake section of the Geer Fear Survey Schedule; specified that their fear of serpents significantly interfered with their interests in gardening and camping; and were currently not under desensitization treatment. The average age of the fifty-five subjects who met these four conditions was thirty-three and a half years, and their average age when they began having acute ophidiophobia was seventeen and a half years. All but four were female.[64] That a morbid fear of such severity occurs under climatic and ecological conditions like those of Oregon, where serpents are ordinarily no more a realistic threat than wolves or bears, is remarkable.

A case study from Britain[65] involves Ms. A., a schoolteacher whose emotional life, though otherwise quite normal,

> had been severely restricted for over 10 years by a profound fear of snakes. She was unable to watch movies for fear that a snake would appear on the screen and required her friends and relatives to telephone her in the morning to warn her if there was a picture of a snake in the newspaper; she also avoided objects made of snake skin as much as possible and had recurrent nightmares about snakes. Her treatment was precipitated by an incident at her school when she panicked and burst into tears in front of a class because one of the children had given her a magazine containing a picture of a snake. Subsequently she was unable to include magazines and certain books among her teaching materials, which interfered with her work to such an extent that her superiors pressed her to receive treatment.
>
> Eight sessions of psychotherapy revealed *no significant personality disorder* and failed to improve the phobia. She agreed to try in vivo exposure to a 1.2-meter-long live python after reassurance that the speed and duration of exposure would be under her control. The treatment was videotaped and took place during two 2-hour sessions in a large room. The python was initially enclosed in a transparent plastic case placed 9.2 meters from the patient who reclined in a comfortable chair.
>
> After 40 minutes of exposure, Ms. A's anxiety reached panic level, and she ran out of the room. On her return 15 minutes later, she wept intermittently for 10 minutes, experiencing strong feelings of guilt for no apparent reason. Shortly after she stopped crying she vividly recalled a previously forgotten episode that had occurred when she was 13. While walking in the country with her two older brothers she had unexpectedly seen a snake and had run away in a panic, shouting, "I'd rather see my mother dead than see another snake." She experienced a transient increase in guilt after recalling this but relaxed considerably after discussing her guilt. By the end of the session Ms. A was able to look steadily and fairly calmly at the enclosed snake from a distance of 3.1 meters.
>
> The second session started with the enclosed python still 3.1 meters away. When she was describing the snake, Ms. A reluctantly acknowledged that part of its skin pattern resembled closely the lipstick imprint left by a kiss. Immediately after

this, she experienced intense feelings of disgust and nausea, followed by tears. She then suddenly had the following vivid fantasy: "I remember I was about 9 years old, with a girl friend, at this fairground. We looked into this tent and saw a fat woman holding a sack. She suddenly drew out a long black snake and put its head in her mouth, beckoning us towards her. I was terrified, and we ran off."

She then became fairly calm and shortly thereafter visualized another scene, in which she described herself at *age 5 or 6* visiting a reptile house and *being fascinated by the snakes* and angry with them because they would not move, *but not frightened.* Shortly after describing this she began to feel angry with the python which was now 1.5 meters away from her but still enclosed. After 10 minutes of mounting anger she suddenly started screaming obscenities at the python, jerking her whole body with rage, and banging her fists on the chair. This frenzy of rage lasted 3 minutes, after which she fell on her knees and sobbed unrestrainably for several minutes. Afterward she felt very calm and allowed the snake to be taken from its container. During the remaining 50 minutes the snake was brought progressively closer until she was able to touch it with only mild anxiety. She was followed up for 6 months and had a mild residual phobia that did not interfere with her life or cause her any troublesome anxiety.

OPHIDIAN IMAGERY AND THE SUBCONSCIOUS MIND

Occasionally revealing itself through dreams and drug-induced hallucinations, the subconscious mind is a valuable source of clues of deep, latent fears. The influences of culture on the manifest content of dreams are complex and remain unresolved, for there is no simple relationship between the two. Dreams seem to be selectively edited by the dreamer, have some relationship to sleep patterns, sex, and age, and sometimes are highly distorted versions of the individual's experiences or knowledge.

Roy B. D'Andrade reviews much useful anthropological information on primitive peoples' dreams. A large sample of non-western dreams indicates that 40 percent of the emotions displayed in dreams can be characterized as apprehensive (or fearful or nightmarish), 18 percent as angry, and 6 percent as sad. Another 18 percent are classifiable as neutral excitement or surprise and 18 percent as happiness. D'Andrade's figure for apprehensive dreams is consistent with Thomas Gregor's recent, detailed analysis of dreams of the Mehinaku, a practically unacculturated central Brazilian tribe ideally suited for research because its members have a penchant for the recall and immediate verbalization of dreams to family and housemates. Fifty-five percent of Mehinaku men's dreams, and forty-two percent of women's, involve the theme of anxiety and fear. Women experience a higher level of this though their frequency of dreams if lower. The single major source of anxiety to both sexes is dreams of animals. These account for thirty percent of all anxiety dreams and are considered to be the most distressing because they generally involve visions of assaults by venomous insects, serpents, especially anacondas, and jaguars.[66] Evidently, the subconscious mind is under considerable tension and, especially when its imagery involves fearsome animals, sex, or food, a goodly segment of one's psyche may only be reflecting basic human concerns imprinted during the psychological evolution of primates.

The Sirionó, a hunting-and-gathering people of the interior Amazon, spend much of their time in searching for food. Allan Holmberg found that more than

half of a sample of fifty dreams were concerned with hunting game, eating food, or collecting edible forest products. Dreams of the hunter returning home with success were most common. "One of the striking things about food dreams of the Sirionó," observes Holmberg, "is that they seem to occur just about as often when a person is not hungry as when he is hungry."[67] Since anxiety and stress caused by natural dangers, such as harmful animals, are no less prevalent in Sirionó daily life, it would seem that what is true about dreams of hunger must also be true of fear-laden dreams. Thus, one may question the Freudian claim that dreams of food, like that of some other objects, have a relationship to wish-fulfillment. In the case of fearful dreams of animals, that claim is even more questionable. If wish-fulfillment were the subconscious cause, it could only signify a desire to escape.

In English (London) schoolchildren aged up to fourteen years studied by C. W. Kimmins, dreams of food waned in frequency after the age of ten, but fear as the "manifest content" persisted strongly—with animals named as the cause in 20 percent of the dreams. Dogs, rats, mice, and serpents were the animals most often envisioned by girls, but boys' dreams were primarily of lions, tigers, and bulls.[68] Animal dreams among urban adult Americans, too, are quite remarkable: of 1,170 objects envisioned in the dreams of a thousand persons surveyed by Calvin S. Hall and Robert Van de Castle, the serpent figured considerably more often than any other animal except the familiar dog. In Van de Castle's subsequent study of twice as many persons, animals seem to occur in dreams of men and women with about the same frequency (7.5 percent), men dreaming rather more often of serpents, birds, and "nonmammals." However, the percentage of animal dreams for four-year-old children was 61 percent, and this drops to 39, 28, 24, 22, 16, and 9 percent in subsequent age-groups arranged in two-year groups up to sixteen-year-olds. Comparing his data with the dreams of aborigines, Van de Castle revives a thesis (by Heinz Werner) alleging considerable similarity in the level of cognitive constructions among children in advanced cultures and that among adults in primitive cultures. In an analysis of 250 adult dreams of Australian Aborigines, South Pacific islanders, and North American Indians, he found "exceedingly high percentages of animal dreams, ranging from 23 to 51 percent," with the highest figure prevailing among the Australian Yir Yoront.

I find it hard, however, to endorse Van de Castle's idea that this similarity between modern American children's dreams and those of primitives—in a matter so little understood as the precise stimulus needed for, or the physiological mechanisms that elicit, a *particular* dream image—is due to the "emotional immaturity" and "less-differentiated cognitive structure" of an adult aborigine. The implication that a Yir Yoront adult is at the same level as an American four-year-old is unacceptable, first because each is in harmony with his own, quite distinct social environment and also because no data are given on Yir Yoront children's dreams, which, one would think, ought to have an even higher frequency of animals than those of their parents. The fact is that the animals and the landscape that influence Yir Yoront adult activities, myths, and religion have the potential of molding their dream imagery as effectively as television or the pleasures and tensions of civilized life mold the dream imagery of American adults. The remarkable thing, however, is that the latter dream of serpents at all.

For every 10.6 incidences of "city"/"street" imagery, there is 1.0 involving a serpent amid 1,170 objects dreamt about by a sample of 1,000 persons.[69]

In the southwestern United States, besides their justly renowned annual ophidian rainmaking ceremonies, the Hopi gave much importance to Palulukon, the Water Serpent. From infancy to death this was the focus of religious attention, as were dreams involving it. Hopi-Zuñi tales and religion generally regard it as a benevolent giver. Eggan prefaces her writings on Hopi dreams by stressing that the Hopi felt they had nothing to fear from it if they approached it with good hearts and prayer.[70] Palulukon materializes (causing fright) in every one of the ten dreams she analyzes, but what is remarkable is that six out of eight dreamers were men (a man and woman in the sample had two dreams apiece), a circumstance that may have some relation, or none, to the dominance of males in serpent-linked ceremonials in Hopi culture.

By contrast, in S. G. Lee's statistical analysis of six hundred Zulu, who are not so inveterately steeped in ophidian rites as the Hopi, 33 percent of those reporting dreams were women and only 5 percent were men. Serpent dreams were reported by 17 percent of the women and 3 percent of the men. Other significant dream subjects in Lee's list include flooded rivers (women 16 percent, men 6 percent) and a mythical, priapic riverine monster called *tokoloshe* that assaults women (women 7 percent, men 2 percent), but, oddly, his list mentions no wild animals other than the serpent.[71]

Nightmares belong to a separate category. They disturb sleep far more severely or violently than dreams and therefore are liable to produce a pronounced after-effect ("mood"). They seem to occur "in approximately one-fifth of the normal population," at least in modern European peoples. In the representative cases described by H. Cason,[72] men were more frequently frightened by "animals," "falling," and "accidents" than by "home and family" but were as frequently afraid of "being chased," "death," "murder," and "robbery" as women. Serpents occurred (with a frequency of 10.6 percent) in the visions of three subjects who reported any specific animal. Indeed, in one nightmare, a man was terrified by a *rope*[73] turning into a serpent. A wolf and a wild pig figured in separate nightmares once each, but no other animal was reported. I am not aware of reports of nightmares among primitive people, though it is quite possible that those reported as dreams might have fallen in this category.

In this connection, it is of interest that the subconscious mind laid bare artificially by drugs such as the hallucinogenic potion *ayahuasca* or *natemä* (an extract of the plant *Banisteriopsis*) is akin to that of a person experiencing a nightmare. *Ayahuasca* is used in religious ceremonies of certain tribes in the Peruvian western Amazon basin. The sensations produced in one imbibing it are remarkable for their consistently repeatable pattern. The very first effects are visions of extremely gruesome attacks by venomous serpents, brightly colored anacondas and boa constrictors, and fierce forest creatures like the jaguar. One tribe, the Sharanahua, uses the drug in shamanistic initiation rites that involve the eating of the heart of a boa, rubbing of a serpent's tongue over the initiate's face, and chanting in order to neutralize the anticipated visionary horrors. The action of this drug is discussed at length by several investigators,[74] all of whom report high frequencies of visions of serpents as the initial reaction. The illusions include brightly colored boa constrictors, anacondas, and venomous serpents

that writhe around one's body or enter it through anal and nasal apertures. At least one description[75] stresses this before mentioning visions of injury due to jaguars and ocelots, spirits, large falling trees, and lakes ridden with anacondas and alligators.

An important illustration of the complex link between the deeper, flexible qualities of the normal human mind and the overt, modified expressions of ophidiophobia in abnormal persons is provided by schizophrenia. This disease is of interest because, despite its different forms in persons of average or even superior intelligence, the periodic mental dysfunctions are not relatable to learned behaviors so strikingly as to dysfunctions of innate, neural biochemistry, including that of the hypothalamic segment of the brain. This area modulates and integrates endocrinal (hormonal) effects caused by fright, such as accelerated heartbeat and other changes in level of metabolism described earlier, that enable the body to mobilize its resources for swift action. There are, of course, other specific hormones which affect other capacities, such as normal sexual drives or the desire for food. In schizophrenia physical responses to certain stimuli are markedly slower than in normal persons, the selectivity of the schizophrenic's attention (or inattention) to these stimuli is altered, there is disruption of *conditioned* avoidance behavior, and almost surely there is a genetic basis for the dysfunctions of the information-processing areas of the brain. The dreams of schizophrenic patients differ in many ways from those of normal persons. People, as subjects of dreams, are much more common than animals, but the incidence of dream reports involving animals is higher than in a population sample of normal adults. Of greatest relevance from our point of view is the fact that these dysfunctions involve the visual cortex—the image-forming area which operates in conjunction with the "silent" or "association" cortex (the switchboard interconnecting sensory and motor zones, i.e., precisely those parts important in processing information supplied by specific images formed by the photoreceptor cells of the brain).[76] Since the final, overt expression of the chain of events initiated by visual stimulation may be manifest as elementary fear (the "fight or flight" syndrome) or sexual or gastric stimulation, schizophrenic and normal persons permit a comparison of visual/behavioral links under conditions where the chief observable variable is the factor of excitability of the visual cortex, as judged in terms of fear and avoidance behavior.

In it doubly fortunate that such a study exists and that the investigators, R. C. Cowden, D. J. Reynolds, and L. I. Ford chose the criterion of fear, specifically of the serpent, when evaluating the great discrepancy between intellectual faculties and affective displays in schizophrenics.[77] The choice of serpent as fear-inducing stimulus was entirely fortuitous, for their experiment began with a questionnaire requesting statistically adequate numbers of schizophrenic patients (158) and long-term, mentally sound tuberculosis patients (78) at an army hospital in the United States simply to list things or situations which led them to feel anxious or afraid. Fear of serpents was listed by 31 (19.76 percent) from the former group and 12 (15.38 percent) from the latter, who confirmed this in a separate fear survey scale by rating their fears at from 4 to 6 points ("much" to "terror") and once again in later interviews. All were given an actual behavioral test of their expressed fear, a test which (in brief) consisted in gently determining verbal emotions and their ability to approach, look down into a glass container directly at a 1.8-meter-long serpent which they knew to be per-

fectly harmless, and, if possible, touch it. All but 2 out of the 12 mentally sound tuberculosis patients refused either to enter the room or to approach or touch the animal—a performance frequency that is closely matched by American college students in similar, independent studies. By contrast, only 4 out of the 31 schizophrenics displayed any degree of fear; 17 of the remaining 27 either touched the serpent or held it in their hands while the rest came to at least within ⅓ meter of the glass container.

These experiments clearly show a marked discrepancy between intellect and natural tendency in most schizophrenics: Many of them *expressed* (like the control group) an intense fear of serpents but, in practice, failed (unlike the controls) to demonstrate this fear, i.e., were *visually* unimpressed by, or poorly responsive to, the presence of a specimen close to them. At the intellectual level, therefore, Cowden and coworkers conclude, the *cultural* stereotype was no less intact in the schizophrenics than in the control group. Summarizing their own results and the supporting views of others, they add that "the experience and expression of fear would seem to require a normally functioning hypothalamus, and that in this regard it is necessary to distinguish between emotional *experience* and emotional *expression*." In other words, it would appear that cultural attitudes are normally superimposed on innate neurophysiological functions triggered primarily by form-, color-, or movement-related visual stimulation and that cultural attitudes persist even when their neurochemical basis is deranged, as in schizophrenia.[78]

It would seem from all this that, more than in the lower mammals, tensions and anxieties selectively linked to objects and situations are a normal part of the neural constitution of primates and surface in diverse ways during the fully conscious state as well as during the subconscious. Normal ophidiophobic tendency (and, in the subconscious state, visual imagery) seem to be merely special cases of expression. Many factors besides the innate determinants—the persistence of patterns imprinted socially during early experience, presleep experiences, and the basic structuring of memory systems—give direction to perception, fantasy, thought, and overt action. As the case of Ms. A. described above shows, one need not actually perceive a serpent for an emotional mood to be triggered. What seem to be crucial are the long-term effects of severe emotional distress or stress, whatever the cause and however intermittently expressed.

The effects of stress, of course, vary. In some members of any population they may be mild and dissipate quickly; others may be affected severely but temporarily, while in still others, vague effects may persist. Basically, everyone is directly influenced not only by epinephrine secreted into the bloodstream, but also by secondary feedback effects (again of varying degrees) both during the unconscious and the conscious states. Feedback, as we have noted above, either aggravates ongoing physiological responses and/or prolongs the mood state, which may, in turn, further increase the hormone level and ultimately cause panic. The autonomic nervous system of many persons is prone to this cyclical chain of cause and effect brought about by *stressful thoughts*.

This is borne out by a psychophysiological investigation by J. R. May of *internally self-regulated* responses to stressful and nonstressful stimuli. His goal was to compare the responses with those elicited by external presentation of the same stimuli, with particular reference to ophidiophobia. His findings suggest

that "internally elicited anxiety cues, whether cognitive or physiological, may be of great importance in the production, expression, and maintenance of psychopathological [or emotional] symptoms."[79] Unfortunately, May did not examine epinephrine secretion in his subjects, thirty-six American female college students, all ophidiophobes who had initially taken the Fear Survey Schedule and Snake Questionnaire. However, his instrumental techniques included measurements of heart rate, respiratory rate and amplitude, galvanic skin response frequency, and skin conductance—all known to be affected by changes in epinephrine levels—and a postexperiment questionnaire. In brief, the procedure involved division of the subjects into three groups as experimental controls in order to establish the validity of differences anticipated in responses to differing series of stimuli. These comprised (1) reciting revulsion-producing descriptions of serpents supposedly crawling over the bodies of some subjects (the "internal group"); (2) visual material including both serpent and nonserpent themes (the "visual group"); and (3) solely auditory stimuli (the "auditory group") in place of the recited material used for the first group. The common design, in any event, was to seek differences in the peculiarities of *internally* suggested phobic and nonphobic thoughts as compared with externally evoked ones. The *theme* of serpent, rather than exposure to a live animal, was the crucial stimulus provoking personal stress as well as the physiological components of stress in every member of each of the three groups. The responses were registered by means of electrical switching and other automated procedures following ten seconds of random presentations of a series of stimuli, both phobic and nonphobic. Each stimulus was exerted over no more than ten seconds. Two of the instrumentally recorded parameters of fear, heart rate and electrodermal activity, are shown in figures 100 and 101.

May reports that many of his subjects had difficulty "turning off" ophidiophobic thoughts after taking part in his tests. Their electrodermal changes were less impressive than the large and consistent changes in heart rate observed in response to both internally elicited and visual modes of phobic stimulation. Auditory stimulation produced no significant changes. Internally elicited, i.e., self-regulated (the "internal group's") phobic thoughts produced at least as much subjective anxiety, fear, and physiological activity as similar thoughts triggered externally by pictures (projection slide images) or verbal statements about serpents.

May does not integrate his very significant findings with basic information available on the link between changes in the epinephrine level of the blood and the mental imagery of fear, whatever be the cause of the latter—an actually perceived object, memory of it, or artificial injection of the hormone or of a psychedelic drug. However, one must examine his findings more closely than we can here to realize that they have much bearing on questions of biofeedback mechanisms in the human body—the maintenance of internal, anxiety-evoking cues linked to thinking, recalling, and the anticipation of severely unpleasant or frightening situations. These, as behavioral endocrinologists tell us, can in turn affect one's subjective and physiological state. These feedback effects, then, seem to be the bases of long-term anxieties and emotional moods—shadowy and latent though they may be—which are susceptible to arousal by varied internal impulses, especially when one's cultural and ecological environment is conducive to such arousal.

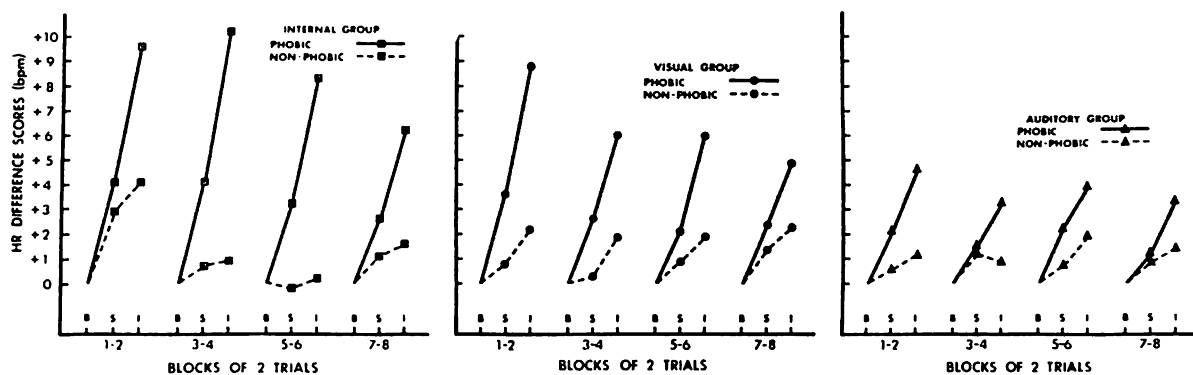


Fig. 100 Mean heart rate (HR) difference scores for the internal self-regulated group, visual group, and auditory group of ophidiophobes and the subconditions (phobic and nonphobic stimuli) across blocks of trials for basal level (B), the stimulus block (S), and the image block (I).

To sum up: Specific emotions like ophidiophobia may be viewed in terms of the chemical basis of memory and atavistic impulses that hinge upon the peculiarities of primate brain structure. Man stands at perhaps the most important end point of phylogenetic differentiation. At the core of his brain, however, is a primitive machinery (represented by the rhombencephalon and mesencephalon in relation to the hypothalamus and limbic system) that has remained basically constant throughout the evolution of birds, reptiles, and mammals. It is this machinery which retains the traces of ancestral learning and memory in the evolutionary sense, i.e., of instinctual reactions related to an individual's part in the preservation of the species. It is this machinery, too, which expresses itself under proper stimulation—and, on occasion, even superfluously, during abnormal calls on the memory bank.

Ms. A.'s case history illustrates the potential of the almost indelible impress left on her mind by a single accidental encounter with a serpent, in a natural setting, when she was thirteen years old. In adulthood, she was tormented by

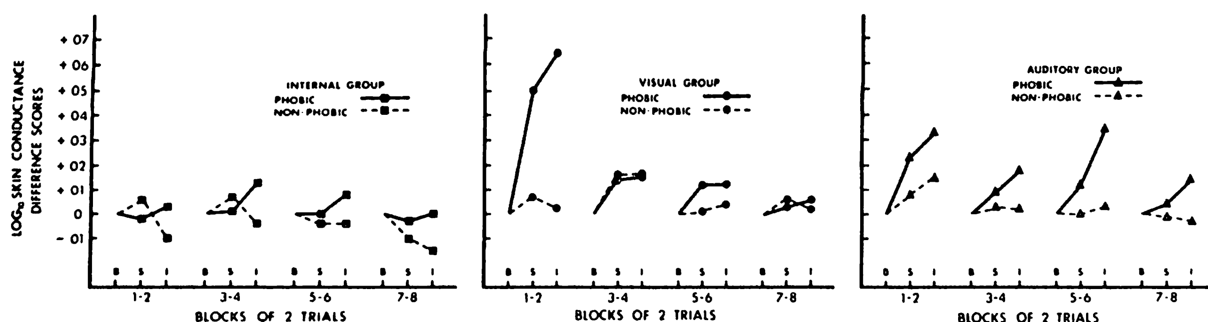


Fig. 101. Mean skin conductance level difference scores for the internal self-regulated group, visual group, and auditory group of ophidiophobes and the subconditions (phobic and nonphobic stimuli) across blocks of trials for basal level (B), the stimulus block (S), and the image block (I).

moods occasioned not by further encounters with live serpents, but by two factors: the *internal* triggering of an anxiety traceable to a frightful subconscious memory of her youthful encounter (physiological determinant) and the *prospect* of chance exposure to images of serpents in printed matter and television (societal determinants totally subordinate to the physiological). It was the interaction of these determinants that produced her intermittent, emotion-charged moods.

Ms. A.'s ophidiophobia was abnormal, but psychotherapy revealed no significant personality disorder in other respects. The information given so far suggests that the two determinants motivating her behavior have always been operative, though at a low ebb, in human societies at large. The biological factors that impel man to fear and loathe the serpent were in existence eons before he acquired the cultural traditions that nurture his bias even in modern urban societies.

SOCIETAL ANXIETIES AND FEARS

The term "cognition" denotes the complex brain functions of higher animals in which olfactory, aural, and visual sensitivities to a constantly changing pattern of environmental stimuli provoke actions peculiar to each species—that is to say, actions prompted by its genetic and neural peculiarities. Fundamentally, this involves neither emotion nor volition. The capacity to escape from a predator (an individual's avoidance behavior) is a cognitive adaptation with high survival value, for the prey species as a whole is constantly subject to natural selection. The giraffe's fears, for example, are quite specific and demonstrable even in captivity: a newborn giraffe is startled by, and will shy away from, the model of a lion, the natural enemy of the giraffe, but will approach and sniff at a simulated giraffe.

Sensitivity of higher primates to the serpent, too, involves cognition which, more often than not, is followed by disconcerting emotion. This condition, however, is not necessarily occasioned by actual danger, though, in evolution, it may have been linked to danger foreshadowed by reptilian form and undulating movement. It is more than a fear of the type that produces immediate flight from the source of the stimulus and then ceases to be stressful not long afterwards. We have seen that monkeys and apes as well as some humans are susceptible to no inconsiderable stress due to memories of, and even objects that simulate, live serpents. Thus emotional responses may also be provoked (with varying effectiveness) by sound, speech, or even suggestions of their form and color. Intelligence and memory are important in discriminative behavior but are not the only factors that influence it.

Learning socially coordinated responses to, and retaining the memory of, environmental hazards that affect the individual as well as the group are capacities that are especially well developed in the primates. Fear lingers across *social* generations even though its cause may be obscure or absent, whereas responses which have little or no adaptive value, and especially those responses which have no clear genetic basis, are easily extinguished or "forgotten" despite intermittent presence of the cause.

Since in all primate societies escape from harm is better ensured through group coordination than when its members are solitary, the survival value of

suitable reactions to fear—any fear—is high. An infant monkey or ape is born into an intensely gregarious group, and the young one's techniques of adaptation to, and survival in, the ecological niche occupied by its species are learned by imitating the group's pattern of behavior, especially its mother's. When survival is at stake, a minimum experience of fear engenders a maximum result in the form of avoidance behavior. This may persist over several social generations and perhaps indefinitely if the object of fear appears periodically or the initial experience of it was drastic—even though the threat recedes immediately afterwards. Baboons and other monkeys flee instantly without looking for the source of danger when dominant members of their troop sound warning cries and flee. Such vocalizations are but a part of the extensive repertoires of communicative signals that have shaped social evolution in the primates and, incidentally, ensured the safety and coherence of their species.

This is illustrated by a band of eighty baboons observed by S. L. Washburn and D. A. Hamburg in Nairobi Park.[80] This group, they write, was accustomed to passing cars and easily approachable. Two of them were eventually shot for parasitological study. As a result, even eight months afterwards, the baboons were extremely turbulent and unapproachable though daily exposed to cars, which they watched from afar. They had learned to recognize danger in just one violent trial, and memories of the incident were strong. Though it is unlikely that the shooting was witnessed by more than a very few in the group, the high survival value of ability to recognize danger had ensured that the actual experience of these few would quickly become part of the entire group's adaptive behavior. Clearly, not every member of a social group need experience an agent of shock in order to express bias against it. This is evident in human society—but the point to be made is that certain human social tendencies are rooted in the nonhuman primate.

Now, as D. O. Hebb has indicated, certain patterns of stressful behavior induced by experimental psychological methods, though compatible with physiological knowledge, cannot be explained solely with reference to physiology and anatomy. He emphasizes that chimpanzees, as a species, are "much more susceptible than dogs to fears that do not arise from pain or threat of pain"; that their fear of serpents is *not* learned; and that the list of objects that frighten them, including perfectly harmless artificial ones they never encounter in their native forests, is a long one.[81] However, the stress produced in the chimpanzee by these novel objects overtly resembles that produced by exposure to serpents. Thus, findings stemming from the use of artificial objects are significant inasmuch as they are consistent with observations on socially transmitted cues like those employed by the baboons of Nairobi Park.

In the three-and-a-half-year-long experiment of Menzel and coworkers mentioned earlier, the object found to be effective in maintaining avoidance behavior was a plastic ball with a motor inside which propelled it along an irregular path and made loud "beeping" sounds that generally caused chimpanzees to be "extremely hesitant" in overcoming fear of it. These experiments were based on a judiciously selected sample of nineteen chimpanzees, all three-year-olds, including wild-born and laboratory-raised ones, none of whom had previously been exposed to this object. To condense the complex procedural controls and details of the data: The chimpanzees were divided into seventeen successive groupings of three animals, each trio being housed together for two months at a

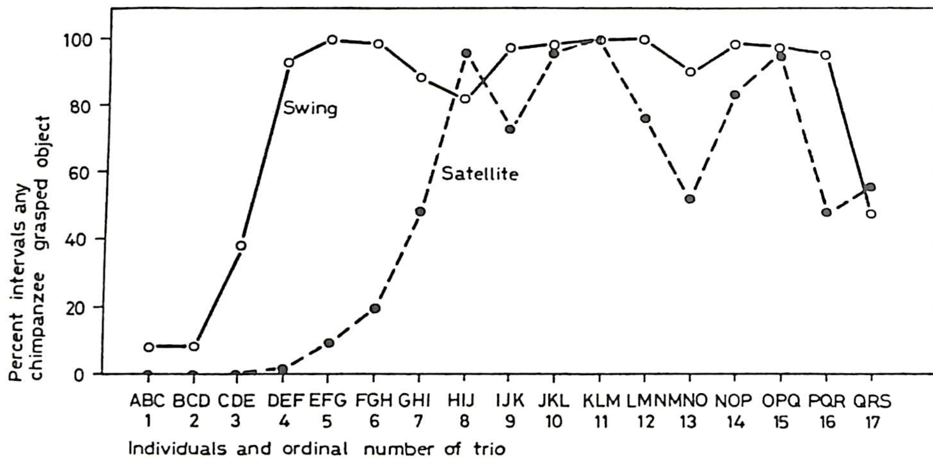


Fig. 102. Changes from one social generation to the next in group reactions of chimpanzees to a fear-arousing object ("satellite") as compared with responses to a mechanically complex swing.

time before one of the trio was replaced by an individual from another trio completely isolated from it. Thus, each such trio constituted a "social generation." For example, the first generation consisted of A, B, C; for the next, A was dropped but D (from another trio) was added to make up the second generation, comprising B, C, D; the third consisted of C, D, E; and so on. Each such social generation was tested with the noisome mechanical contraption (called "satellite"). It was not until the fifth trio that one member of this group became bold enough (through "habituation") to approach and grasp this revolting toy, eventually turning it into a real plaything. From then on, example and precept prevailed in *every* succeeding social generation, every member of which (with an exception of two) eventually succeeded in overcoming a normal fear that it surely would have displayed were it not for the boldness of the pioneer in the fifth generation—and despite the fact that that chimpanzee (F) had been out of circulation from the seventh onward. The tradition passed on by F, however, was more stable across groups (trios) as a whole than within individuals.[82]

The experiments included a control in the form of a swing of unusual design, "selected because of its possibilities for varied forms of vigorous play . . . [though, because] it was a highly complex one for these chimpanzees, some initial caution was anticipated."

Figure 102 summarizes

> the reaction of each "group as a whole" to the objects; i.e. it shows the number of 30-sec intervals in which any member of a given trio grasped the objects. The first several trios avoided the objects or approached them with extreme hesitancy; subsequently there was a steady rise in contact activity across the various groupings of animals, until asymptotic responsiveness was achieved and the dominant activity became play. Pooling the data from both objects, there is a Spearman rankorder correlation of 0.62 between the amount of grasping and the ordinal number of the trio ($N = 17$ trios; $p < 0.01$). Although there was a decrease in responsiveness in the last trios, the animals did not reinstitute a pattern of total object avoidance; instead,

they simply played less vigorously and persistently than their predecessors. In this connection it might also be noted that the same one toy "satellite" lasted through the first several trios; but once group asymptotic performance was achieved, each trio managed to smash a new object on almost every session.

It is important that the acquisition of a "play tradition" proceeded at somewhat different rates for the two objects. Thus one cannot account for all the data on the basis of a single bold individual or even a single trio. There were two trios (No. 1, 2) that avoided both objects, other trios (No. 4–6) that were bold toward one object and cautious toward the other, and still other trios (No. 7–17) that were bold toward both objects. The two individuals who led the process of habituation (individual E for one object, individual F for the other) had, in previous tests of manipulatory responsiveness, been relatively bold toward new objects. Nevertheless, there was no significant correlation overall between a given trio's score in the present test and the frequency with which the constituent individuals contacted strange objects or a test person when alone (Spearman's rho = 0.33 and 0.02, respectively).

Table [10] shows each individual's performance. It can be seen that in some respects these data are less consistent than the group data of figure [102]. Thus there was no clear tendency for individuals to manipulate more with repeated exposure to these objects—even though this was true of the "cage culture as a whole." (For the 15 individuals who were used in 3 groupings each, Friedman tests of the age-experience effect rendered chi-square values of 4.2 and 1.7 for the satellite and swing objects, respectively. With degrees of freedom = 2, neither value is significant at the 0.10 level.) This superficially surprising finding reflects several facts. First, an animal's manipulation score depended not only upon his boldness toward the object, but also upon his status within the group and the responsiveness of other individuals. Over all groupings, there was no significant relationship between dominance status (as measured by competition for food) and manipulation, or between earlier manipulation tests conducted on individual animals, and the present manipulation scores in a group setting. Second, ordinarily only one animal at a time contacted a given object. The typical group reaction was for each individual to take his turn; and the order in which various individuals took their turns was often different for the two objects (table [10]). One of the most striking phenomena here was that many "timid" animals hid in a corner and whimpered while the "bold" animal in that trio played vigorously with the object and caused it to move unpredictably about the cage; and yet, in the next grouping, the timid animal became the bold one and someone else cowered in the corner. Some reverse cases also occurred. For example, F in the 5th trio instituted the first few vigorous interactions with the "satellite" object; but when he started to grasp the object again in the first sessions of the 6th trio, a new animal followed his example and then displaced him and took control. It would seem that in general individual behavior could be predicted better from what other individuals or even groups had done, than from what the individual himself had previously done. In this sense, the concept of social "roles" seems appropriate.

The performance of the 3 wild-born animals (individuals K, L and P) should be distinguished from that of the others. The wild-borns yielded the three highest individual total scores in the whole experiment. This is consistent with our previous data on the wild-borns vs. restricted comparison and reflects the fact that wild-born juveniles show little of the initial caution of novel objects that is characteristic of restriction-reared chimpanzees. Except when displaced by a more dominant animal, wild-borns manipulated readily from the start. They also displayed a unique behavior with the swing, namely standing on the crossbar and swinging as a child might. Several restricted animals seemed to copy this behavior on a few occasions after observing a wild-born animal: but they did so erratically. "Swinging behavior" never became a tradition.[82]

TABLE 10. SUMMARY PERFORMANCE OF EACH INDIVIDUAL AND EACH TRIO: PERCENTAGE OF 30-SEC INTERVALS THE OBJECT WAS GRASPED

ORDINAL NO. OF TRIO	INDIVIDUAL ANIMALS A	B	C	D	E	F	G	H	I	J	K[1]	L[1]	M	N	O	P[1]	Q	R	S	GROUP AS A WHOLE
Satellite																				
1	0	0	0																	0
2		0	0	0																0
3			0	0	0															0
4				0	0	1														1
5					0	10	0													10
6						2	20	0												20
7							37	4	19											48
8								54	52	17										96
9									12	6	57									73
10										24	36	41								96
11											82	18	0							100
12												77	0	0						77
13													1	18	38					53
14														1	31	60				84
15															57	48	15			96
16																48	2	0		48
17																	56	0	0	56

ORDINAL NO. OF TRIO	INDIVIDUAL ANIMALS A	B	C	D	E	F	G	H	I	J	K[1]	L[1]	M	N	O	P[1]	Q	R	S	GROUP AS A WHOLE
Swing																				
1	5	4	1																	9
2		7	1	1																9
3			0	0	38															38
4				4	7	93														93
5					67	94	26													100
6						94	92	0												99
7							89	0	20											89
8								73	21	3										82
9									5	0	95									97
10										0	81	83								98
11											82	62	0							100
12												98	1	3						100
13													21	57	63					91
14														8	87	85				99
15															83	84	0			97
16																91	0	0		92
17																	0	48	0	48

SOURCE: Menzel, Davenport, and Rogers, "Protocultural Aspects of Chimpanzees' Responsiveness to Novel Objects," table 1.

[1] Wild-born chimpanzees.

Menzel and coworkers' experiments disclose an important link between intelligence and memory and the propagation of an acquired, i.e., nongenetic, *sentiment* (object of fear turned into a toy) across numerous social generations—though, being nongenetic, it was fragile and liable to be discarded in any one of them subsequent to the seventh. Yet, the spontaneous emotion elicited by the "satellite" in every member of a trio seeing it for the first time was one of abhorrence. The chimpanzees' behavior throughout the course of the experiments can only be attributed to the example set through subtle gestures by a single experienced member in each trio.

Now, recent research on gestural communication among nonhuman primates suggests that man, too, possesses a gestural system of communication. Indeed, P. H. Stephenson proposes that gestures probably constituted the dominant form of communication during an early phase of hominid evolution prior to the appearance of spoken language and that, primordially, they arose from an even earlier system linked to predation. Citing several features of brain structure that regulate basic emotional responses, he explains from a comparative anatomical viewpoint why human beings no longer possess a system of calls (or alarms) of the simian type yet retain the remnants of one beneath the newly acquired capacity of speech.[83] I only need comment that, though most human communicative behavior is commonly assumed to be verbal, many behaviorists attach at least equal significance to rudimentary nonverbal, usually involuntary, signals—including vocal, bodily, and chemical ones—for which the term "prosematic" is increasingly favored in biology. These patterns of behavior, on which the very survival of the individuals of a species depends, are highly distinctive. The closer the evolutionary relationship between two species of primates, the closer the resemblances in brain anatomy—and, consequently, patterns of involuntary expression of emotion—are likely to be.

In human societies, language and symbols used in transmitting a particular emotional sentiment generation after generation provide a precise parallel to the gestural communication effective among the chimpanzees in Menzel and coworkers' experiments. The difference in the case of ophidiophobia is that it has natural ecological and genetic foundations in nonhuman and human societies alike. However, one would ordinarily tend to attribute the popularity of a myth or superstition rooted in ophidiophobia—say, regarding a serpent deity—to man's cultural conservatism. If the propriety of extending the term "culture" to chimpanzees be moot, does not their societal mode of transmitting a sentiment merit at least the term "protocultural"? Chimpanzees lack speech, but modern computerized methods disclose that they can skillfully communicate even with humans through sign language and graphic symbols.[84] The fact remains that the psychophysiological components of anxiety and specific innate fears, being identical in chimpanzee and man, unite our two species as closely on the criterion of social transmissibility of emotions as on the obvious, evolutionarily equally significant criterion of anatomical similarities.

It is not improbable that *Aegytopithecus*, the oldest known common ancestor of man and apes, exhibited these sensitivities and transmitted them socially as far back as about 30 million years ago. It already possessed dentitional features (fangs in males, associated with social dominance over females and juveniles or group-protective aggression) and a cranial capacity (linked to full stereoscopic and color vision, intelligence, and, with it, susceptibility to stressful behavior)

that seem to place it on a par with the larger modern monkeys.[85] These, as we know, are organized into tightly knit bands of adult males and females, juveniles, and infants that maintain the biases of the species whether they have adaptive value or (occasionally) not. Protection of the young and concerted behavior of the entire band threatened by a predator are highly developed, sometimes to the extent of excitedly mobbing the latter. This behavior commonly involves hoots and shrieks, jumping on branches until they fall on the intruder, even throwing branches at it (as chimpanzees are known to do), and, most remarkably, venting emotion by group defecation and urination. This is a normal consequence of severe mental agitation and is often observed in the laboratory.

In the field, as we noted earlier, even the lowly lemur vents its emotion at the sight of a certain species of predatory hawk by urinating and defecating. Guenon (vervet) monkeys mob the cobra and puff adder in particular and follow them through thickets agitatedly, to the accompaniment of their specific alarm call, the "snake chutter." Recent observations of vocal communication reveal the extent to which vervets categorize objects in their environment into groups. They identify different predators by emitting distinctive alarm signals that warn members of the troop about an impending danger. Tape recordings of such calls, played back deliberately when predators are absent, cause vervets to run up into trees in response to leopard alarms, to look upward after an eagle alarm, and to look downward after a serpent alarm. Adult vervets issue warnings primarily about leopards, martial eagles, and pythons. The juveniles are less selective but not arbitrary. Certain terrestrial mammals, for instance, provoke them to emit leopard alarms, certain birds provoke eagle alarms, and even long, thin serpent-like objects provoke serpent alarms though more than a hundred species of mammals, birds, and reptiles that pose no threat are normally seen—and silently ignored—by all members of the troop.[86]

The scientific field reports cited earlier suggest that predation is an insignificant factor in the mortality of simian populations, though the actual frequencies of snakebites are difficult to determine and remain unknown. Our knowledge of human death rates due to snakebites in the tropics and of man's ambivalent awe of the serpent even in regions where it is not a serious menace prompts a few comparisons:

Since the process of natural selection simultaneously affects the course of organic evolution and the social development of an entire species within its particular ecological sphere, the acquisition of visuo-motor sensitivities to serpentine form and movement has obviously been advantageous in the adaptive radiation of all primates. Simian societies acquired these faculties and still constantly exercise them gregariously in a narrow range of habitats, generally open woodland, less frequently dense tropical forests. And they are apparently more effective at this than man, who, since early hominid evolution, has steadily migrated into an extremely varied range of habitats and, at least until the era of agriculture-based urbanization, has normally lived in very small, disparate groups. Human perceptiveness, especially through smells and sounds, is less acutely developed than in the anthropoid apes and monkeys and, as an adaptive function linked to escape behavior, appears to be much less effective at the group level. The genetic foundations of ophidiophobia in man, however, seem

to have diverged little or not at all from those possessed by his closest nonhuman ancestors.

In human societies, language and symbols reiterate simian sentiments of fear in peculiarly human terms. This is obvious enough in the case of fear of clear-cut threats such as fire. But ophidiophobic tendency is often a hypersensitivity that may be self-induced and whose emotional impact is rather akin to that incited by other imageries (real or imagined) which are not objectively dangerous, or at least not so dangerous as many people think—for example, thunder, darkness, open or closed spaces, heights, and sharp objects. In the ontogeny of specific fears, exceedingly few animals fall into the same category as the serpent or cause the intense emotion known as dysthymic neurosis. "Dangerous" carnivores like the tiger, bear, or wolf, though "fearsome," do not repel man as serpents do; indeed, they are considered "handsome."

The significance of social interaction as a factor abetting the expression of nervous tension and fright in human societies cannot be overemphasized. The experimental psychologists L. E. Sjöberg, E. Svensson, and L.-O. Persson report on the relationship between social interaction and verbal expression of emotions, citing as an example "the lack of preoccupation with religious phenomena in our [Western urban] culture, giving rise to a lack of verbal expressions for religious feelings" insofar as this negative aspect could affect measurement of mood on their scale.[87] The implication that interests us, however, concerns the exactly opposite case of societies that *do* verbalize their emotions and achieve cultural coherence through cult practices and superstitious beliefs rooted in tension and fear.

The serpent, of course, has no monopoly on stressful responses that manifest themselves as adaptive or simply mechanical social behaviors. Many species—usually the larger carnivores but, strangely, very few of the insidious, more dismaying species of invertebrates—have constantly put man on the alert in the course of his social evolution. It is not that these other harmful species cannot elicit deep sentiments, but rather that today few of them fester in human societies so pronouncedly as the serpent. This animal, as our examples have shown, surfaces even in the subconscious human mind through dreams, nightmares, and hallucinations rooted in complex hormonal etiology and the strains of day-to-day existence, even though these strains, especially in urban societies, may not actually have been induced by exposure to, or thoughts of, reptiles.

Is it possible that, generation after generation, dreams of animals have fortified cultural biases partly through charismatic tribal leaders' handing down their sentiments by a mechanism of group behavior the elementary components of which are evident in the experiments with chimpanzee trios? Primitive societies everywhere, and civilized peoples as well, have always regarded dreams as portents and been guided by their imagery in matters of private belief, priestly advice, ceremony, divine symbolism, and art. Dream totemism, a term especially exemplified by the Australian Aborigines, refers to the belief that a person is represented in a dream by natural species or objects, such that the Aborigines' intimate relationship with nature is carried over into dream imagery and inordinately emphasized in tribal life. Their medicine man, the custodian of religious conscience, embodied his "assistant totems," or spirits, most often in serpents, and sometimes in the lace lizard. The preference for these two species

is documented in ethnography and is also reflected in much psychoanalytical speculation about the meanings of aboriginal myths.[88] Similarly, the American Cherokee tribe's high esteem of the rattlesnake was fortified by their medicine man. His formulary comprised not only herbal antidotes, but also tedious incantations and rituals, practiced as earnestly after one dreamt of being bitten by a rattlesnake as after a real bite.[89] In New Guinea, Roro and Mekeo sorcerers rely on dreams to enable them to find a "snake stone" that bestows magical power over deadly reptiles.[90]

Modern human societies cling to animal symbols that probably represent the same biases as those of Palaeolithic and Neolithic peoples. Since these biases were shaped early in hominid evolution, which occurred in the tropics, surely it must be the *ubiquity* of the serpent (nearly as much as any psychobiological factor) that everywhere reinforces the attitudes initially nurtured in the serpent-infested tropics and thus fosters ophidian myths.

As we have seen, in the colder parts of the Northern Hemisphere bears and sometimes wolves are cult animals. They are seen far oftener than the serpent and participate in mythic kinship relations with humans in much the same way that *nāgas* and *nāgiṇis* do in Hindu mythology. Yet, odious dreams of serpents persist. Boas exemplifies this with respect to Vancouver Island, where harmless serpents are visible only seasonally and venomous species unknown. Its inhabitants, the Kwakiutl, regard hunting dreams, that is, dreams of bears, wolves, foxes, and a great variety of other animals, as good omens. Dreams of serpents (or of *sisiutl,* the double-headed serpent with a human face in the middle) presage evil particularly when experienced by shamans, whose cures are guided by dreams, and spell only danger, paralysis, insanity, or death. Indeed, Boas commences his list of ominous dreams with one involving serpents.[91] Similarly, dreams of serpents[92] carry horrendous portents for the Ainu of Sakhalin and northern Japan, though it is the bear cult[93] for which the Ainu are justly more famous. A. I. Hallowell's classic study of bear ceremonialism in northern Eurasian and northern American tribes correctly discounts psychological explanations of qualities attributed to bears "as the sole stimuli to the development of a venerative attitude."[94] It would hardly be surprising, however, if, because of hunting economy and cultic fervor, the powerful and ferocious bear figured importantly in tribal dreams; thus it is noteworthy that in a later study devoted entirely to dreams of the North American Ojibwa Hallowell mentions so little about the bear, and nothing about its frightfulness.[95] In contrast, Eggan's analysis of ten Hopi dreams reveals that the mythical serpent Palulukon, which the Hopi normally regard as beneficient and harmless, appears in every one, and always with frightful imagery. It is doubtful that Hopi society is any more preoccupied with ritual observances and veneration of the serpent in daily life or tribal ceremonies than the Ojibwa is with bears.

Hierophants of the major religions of antiquity perpetuated antiserpent biases through dreams and talismans just as effectively as the practitioners of primitive religion. In Mesopotamia, special priestesses (*sal.ensi* in Sumeria, *šā'iltu* in Assyria) officiated as dream interpreters. Priests beseeched the gods of dreams—Mamu, Anzaqar, and Zaqīqu—for help in defeating demons that were incarnate in serpents, scorpions, and other animals. Indeed, etymologically the name Zaqīqu is derived from an Akkadian verb that connotes the movement of nocturnal, swiftly moving demons who "slip through the door like serpents . . .



Fig. 103. The dreaded Babylonian female demon Lamashtu, portrayed on an amulet.

drift through holes in the threshold," a faculty which, in a hymn, is also attributed to the god Nergal, who is chthonic.[96] In an amulet, the dreaded demon Lamashtu is portrayed as a creature with talons on her feet, a lioness's head, and a long winding serpent in each of her threateningly outstretched hands (fig. 103).

Greek women slept in the temple of Asclepios—an ophidian god—in the hope of being "touched" by him and cured of barrenness. There are inscriptions about a woman who dreamt that a "handsome boy uncovered her, after that the god touched her with his hands"; about another woman, the inscription reads, "it seemed to her in her sleep that a serpent lay on her belly," and in yet another, "with that serpent she had intercourse."[97] Nevertheless, mythic boons like Asclepios's do not conceal the discomfort serpents probably evoked in the dreamers.

Hindu dream symbols are perhaps best codified in a Sanskrit work by Jaggada Deva, of the thirteenth centruy A.D. Its bases, however, were in exis-

tence continuously at least two millennia earlier, for references to serpents are scattered and inexhaustible in Hinduism's immense repertoire of religious texts, notably the *Śatapatha Brāhmaṇa*, the *Atharva Veda*, the *Garuḍa Purāṇa*, and others too many to be named. It is of interest that in Vedic times high priests ritually imbibed *soma*, a hallucinogenic brew, but its effects on the subconscious mind and its visions are unknown. It would be odd if those visions had not in some measure influenced the highly fanciful oral and literary Brahmanical expositions.

The shamans of China interpreted dreams, including, presumably, their own. Since in ancient China, as elsewhere, sons were generally considered greater assets than daughters, the following question put to a *wu* and the answer are revealing: "Divine me for my dreams. What dreams are lucky? They have been of bears and grisly bears; they have been of cobras and [other] serpents." The chief diviner's shrewd reply: "The bears and grisly bears are the auspicious intimations of sons, the cobras and [other] serpents are the auspicious intimations of daughters."[98]

We may conclude these examples of conservatism in cultural biases due to hierophantic influences by considering Islam, whose theologians and folklorists treat dreams and visions earnestly.[99] The prophet Muhammed is said to have relied on interpretations of portents—indeed, the Qur'ān is reputedly a product of his visions. Compilers of *ḥadith* attribute to him the following statement: "When any of you sees a dream that he likes, it is from Allah. He should praise Allah for it. When you see a dream that you dislike, it is from Satan. You should seek Allah's protection and not mention it to anyone. Then it will cause you no harm."[100] Despite Qur'ānic expurgatory injunctions, iconoclasm, and (among the orthodox) disapproval of graphic representation of living things, Muslims attach symbolic values to many animals. Most of these symbols, of course, are rooted in the superstitions and divinatory practices carried over into Islam by the varied ethnic groups converted to it; a goodly number of the superstitions were indigenous to Arabia in the pre–Islamic era; others are perpetuated by Sufi and other cults built around the veneration of saints in all the Islamic countries. The remnants of ophidian cults are not obscure.[101]

In these contexts, the widespread Muslim belief in *jinn*, or *jnun*, is pertinent. *Jinn* are a race of dangerous spiritual beings constituted of flames or vapor, which transform themselves at will into a variety of animals, both noxious and friendly, or into human beings and, most importantly, appear is dreams. They are essentially malevolent and belong to the class of devils, though some of them may be "normal." The subject is allied to concepts of the true nature of Satan. In addition, ongoing theological differences keep alive an interest in the elusive *jinn*. Serpents "are one of the forms in which *jinn* most often choose to appear," and, in a legend involving Muhammad, a serpent is clearly equated with the devil. Professional diviners, men and women known as *kuhhān* and *kawāhin*, interrogated by people under stress or on important occasions are of special interest. Their mantic knowledge is said to be based on ecstasy inspired by demoniacal forces, for their utterances are those of *jinn* which, as serpents or birds, take possession of them during their trances.[102] Customs like these ensure the reinforcement of biases represented by various symbols.

Though an eleventh-century dream book, the *Tabaqāt al-Muabbirin*, codifies interesting Muslim sentiments, al-Damīrī's zoological treatise (already referred

to) is more relevant for us in that it contains interpretations of dreams of animals. Suffice it to add that al-Damīrī devotes to dreams of serpents fully three times as much space as to dreams of *jinn* and scorpions. The latter portend mostly abnormal or immoral sexual relations, but the interpreters have no comment on their venom and appearance. By contrast, al-Damīrī focuses on the serpent's generally "inimical" qualities, bite, and poison; recommending, furthermore, that a spell against it be uttered thrice before sleeping. The prophet Muhammad himself is said to have prayed, "O God . . . I seek refuge with Thee from Satan causing me to be in a state of commotion at the time of death . . . and I seek refuge with Thee from dying bitten by a serpent or stung by a scorpion."[103]

To sum up: Visions perceived by the subconscious mind have shaped religious customs as importantly as have experiences gained consciously. Furthermore, in the continuum of hominid organic and social evolution, man, like every higher animal species, has been subject to emotional stresses that have complex physiological effects. Experiments show that even rodents respond to fear-inducing situations with greatly intensified activity of the sympathico-adrenal system, to the extent of death from the side effects.[104] These are identical in man, and are described in detail from a medical viewpoint in W. B. Cannon's analysis of diverse aboriginal tribes in Australia, Brazil, Africa, and Guinea. His data strongly suggest that no explanation other than psychogenic stress caused by purely cultural pressures can account for the onset of swift, progressive physiological deterioration, sometimes leading to death. The emotional tension of the individuals in these cases was usually the direct result of condemnation by sorcerors or medicine men when tribal regulations, such as food taboos, were violated.[105]

The psychogenic stresses of ophidiophobia also derive from the peculiarities of the sympathico-adrenal system but differ importantly in that they are rooted in the complex interplay of universally manifest genetic and evolutionary determinants and sometimes local environmental ones. However, the cultural expressions of these are entirely capricious. Instances of intense anguish if not death from shock caused by the bites of, or close encounters with, quite harmless species of serpents are as well documented as the groundless torment of ultrasensitive ophidiophobes who merit psychiatric treatment. Apparently "normal" people who have frightful dreams of animals exemplify a more common, socially important phenomenon. Little is known as to why one dreams at all. It would be rash to speculate about the causes in biochemical terms or connect dream imagery to actual experiences of any particular animal species, for the dreamer may have had little or no etiologically significant exposure to it, or even thought about it, immediately prior to the dream. Memories carried over into sleep certainly play their part.

One can only surmise that all images visualized during the subconscious state, whether normally as dreams or abnormally as the side effects of a drug, are but a *symptom* of the tedium of daily life, of the varied stresses that afflict the members of every society. The theory that anxiety is a drive that tends to become generalized from one specific stimulus to other, quite unrelated stimuli is widely prevalent in modern human psychology. Whether this theory (which is not derived from research in ophidiophobia) is correct or not does not concern us. However, an intensive experimental test of this theory was undertaken by Buss,

Murray, and Buss on the basis of the reasonable assumption that individuals who exhibit marked anxiety when subjected to verbal, pictorial, or other forms of aversive stimuli are best studied with respect to stimulus generalization patterns by applying stimuli directly related to the primary cause of an anxiety. What is significant is that these investigators utilized a set of sixty-eight anxiety-provoking items, every one of which involved pictures or verbal descriptions of the appearance or behavior of serpents or objects resembling them, in order to categorize the responses of normal American college students of both sexes divided into groups of low, middle, and high ophidiophobic sensitivities. Their responses, measured on a nine-point scale, show that women possessed somewhat stronger tendencies to generalize their anxiety than men and that whether an anxiety-prone person displays an anxious response depends on the nature of the specific, primary threat. Buss, Murray, and Buss[106] conclude that future research in their field should be directed not so much to issues of general arousal levels as to issues involving specific fears and the threatening situations related to these fears.

Extrapolating the information in this chapter to the world of the subconscious one can say no more than that dreams of serpents seem noteworthy chiefly because of their frequency and extraordinary social repercussions. The elementary primatological bases of these repercussions cannot be minimized. Experimental study of dreams of anthropoid apes, as we will see in the next chapter, may disclose more than we now know about ophidiophobia and the symbol-making potential latent in it. That modern urban man exhibits these facets inordinately is the measure of the uniqueness of the suborder Serpentes as much as of the genus *Homo*.

CHAPTER 6

The Wider Implications

ANTHROPOLOGICAL PERSPECTIVES

The structural anthropological tenet that, in general, animals are *bons à penser,* i.e., possess the potential of suggesting a "a mode of thought," is rooted in early writings on primitive religion; but only in recent years has this idea been admirably established by Claude Lévi-Strauss, who coined these useful expressions. Their broadest connotations are amply borne out by the cult of the serpent. Nevertheless, I must point out that this animal's unique and pervasive influences on human emotion are overlooked in current hypotheses as to why certain animals elicit symbolic thought and, furthermore, suggest themselves as cult objects more effectively than others. A very few species—spiders, worms, rats and mice, and perhaps others—seem capable of exciting the emotions of some persons to proportions that necessitate psychiatric treatment and, it is possible, in a rough sense do so because of etiological characteristics similar to those of acute ophidiophobia. These species, however, count for little in mythol-

ogy and are practically never deified. It will be useful, therefore, to examine the relationship of fear and symbolic thinking before resuming discussion of the possible origins of serpent cults. The word "fear" needs no further qualification, but even the most inclusive and useful definition of "symbol"—as something which stands for something else—generates sharp expository differences in anthropological hypotheses that accede to the psychoanalyst's methodology.[1]

It is noteworthy that the criterion of fear predominates in explanations of symbols in an early work on animal worship, published in 1760 by de Brosses, and that modern structural anthropologists have paid scant attention to that criterion. This neglect may be attributed partly to de Brosses's unreasonably sharp distinction between "savages" and civilized peoples. The factors determining religious sentiments, he believed, were four, of which only two—fear and admiration of supernatural powers—affected the "savage," whereas civilized persons were influenced, in addition, by their qualities of gratitude and reason.[2] Aside from this faulty reasoning, the fact remains that anthropologists have left unexplored his notion of the *primacy* of fear in animal-oriented aspects of religious life. Nor have they attempted to seek out the species that have an intimate bearing on that primacy on a cross-cultural rather than a parochial scale. Thus, structuralists by and large have been concerned with the interpretation of overt sociocultural attitudes vis-à-vis symbols more than with the underlying sentiments that transcend the field of cultural anthropology and demand eclectic attention.

Certain sociocultural theories—among them those of Wundt, Tylor, Robertson Smith, Mauss, Reinach, Lévy-Bruhl, and others—employ the word "fear" in the colloquial, nonbiological sense of an emotion incited by superstitious dread of imaginary forces. Though these writers have influenced anthropological theory considerably, I will not discuss their shortcomings (which have been reviewed concisely by Evans-Pritchard) beyond commenting on a typical one: Tylor, in 1873, wrote that he was obliged to dwell "shortly and slightly on Animal-worship, not as wanting in interest, but as over-abounding in difficulty." He acknowledged that the element of fear was but "a partial truth"[3] but attempted no inquiry into the special emotion-rousing qualities of any particular species, including reptiles, whose importance in cult he well recognized.

Early in our century, Durkheim employed the word "fear" in a cultic context. It was, of course, devoid of the precise modern scientific meaning stressed in these pages. "If a certain species of animal or vegetable is the object of a reverential fear," he believed, "this is not because of its special properties, for the human members of the clan enjoy this same privilege, though to a slightly inferior degree, while the mere image of this same plant or animal inspires an even more pronounced respect. . . . So it seems as though each group [of totemists simply takes] as its insignia the animal or plant that is the commonest in the vicinity of the place where it had the habit of meeting." Indeed, Durkheim emphatically denied the validity of the formula *Primus in orbe deos fecit timor,* since "the beings of the totemic species are his [the cultist's] friends, kindred or natural protectors from him. . . . The sentiments at the root of totemism are those of happy confidence rather than of terror and compression."[4]

The serpent, of course, is not the only animal that can evoke a *particular* sentiment or "mode of thought"; and "terror and compression" (which Dur-

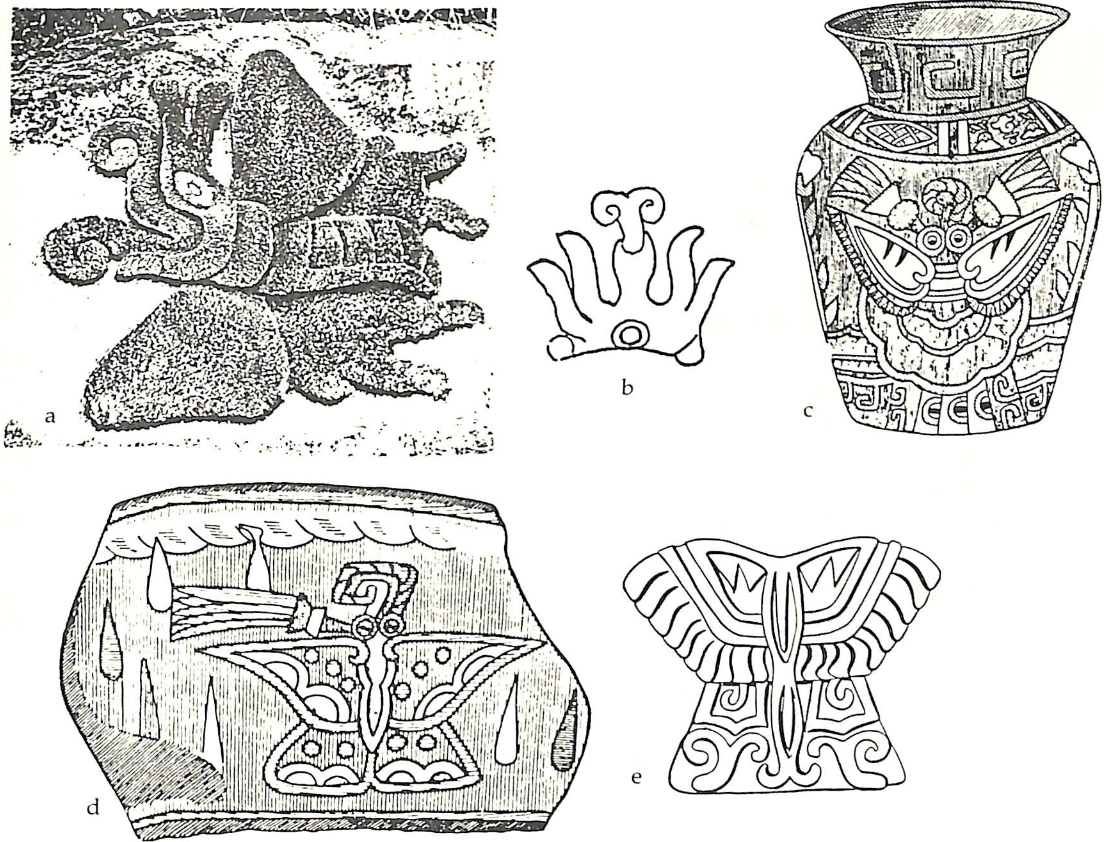


Fig. 104. The butterfly in Mesoamerican religious art: *a,* a rupestral relief from Acalpixcan, Mexico, probably representing the goddess Itzpapalotl, showing clearly the ophidian bifid tongue characterized in the rest of these figures; *b,* mask of Xiuhtecuhtli, the god of fire; *c–e,* painted pottery motifs from Teotihuacan.

kheim so lightly discounts in his generalization) need have no relationship to an animal's real traits. The Tlingit of Alaska dread the land otter out of pure superstition, though it is a docile creature. It is feared more than the brown grizzly bear and has the reputation of being a kidnapper, perpetually opposed to mankind. In contrast, the sea otter excites no emotion and is freely hunted for its fur and its femur, which is used in divinatory rituals.[5]

An animal species may in actuality be the most innocuous imaginable, yet carry repugnant associations as well as the symbol of a venomous reptile: The Aztec goddess Itzpapalotl was conceived as a butterfly, but she was demonic and had death symbols on her face. In artistic representations the butterfly is endowed with a bifid tongue even in abstract emblems such as the mask of the god of fire, Xiuhtecuhtli. Now, carnivorous, wild members of the dog and bear families are no more dangerous to man than the larger felids. They seem to have suggested themselves importantly as symbols for different reasons, though, as numina, the canids have received rather less and bears no more attention than the felids. All three mammals surely affect (so one might think) man's propen-

sity for symbol making more powerfully than the butterfly. Yet to the Aztecs and other Mexica, Itzpapalotl was a major goddess, no inferior to coyote and jaguar spirits (fig. 104).[6]

What determines the choice of a particular species for a symbolic role in cult practices is hard to generalize. Douglas suggests that such choices are prompted by anomalies of an animal's appearance or habits which make its accommodation in primitive classificatory schemes irksome.[7] Her interpretation as to why the Lele of Central Africa have adopted the "taxonomically anomalous" pangolin as a cult animal is worth examining critically. She reasons that its sacred role must stem from its distinctive features: It is quadruped but is fishlike in possessing scales; is given to climbing trees; is monoviviparous; and is so extraordinarily innocuous that, when accosted by man, it neither attacks nor retreats but curls up shyly into a ball, a voluntary victim for ritual eating. The pangolin's docility may impress the Lele, but Douglas's interpretation is inapplicable to other societies, for this animal is greatly feared in parts of Asia. In Burma, the Chin regard encountering one in the daytime an exceedingly evil omen. Its cries—actually the animal is mute—are believed to mimic the human voice, and if a person responds to the name it calls out he will die at once. The superstition is also widespread among the Laos and Karens and strong enough in Burma, generally, that, in the jungle, people will not respond when called from a distance. The Rengma Naga of Assam consider it a bad omen to see one accidentally. Eating it is taboo in some clans but not in others.[8] Unlike the prolific serpent, the pangolin bears only one offspring at a time, but it is a sexual symbol to the Chinese, who use its parts as aphrodisiac.[9]

The pangolin exemplifies still other paradoxes of the kind that weaken structuralist interpretation of *all* animal symbolism. This animal ranges widely in India and Southeast Asia, yet in India it commands no attention at all among caste Hindus nor, as far as I have been able to determine, among aborigines. In Central Africa the Lele make a major cult of a small species of pangolin but ignore a larger one of the same genus, while the Bini of Nigeria, unlike the Lele, do not regard the pangolin as an "anomalous" creature. On the other hand, the much dreaded serpent *ovbivbie* (the venomous black mamba) fits Douglas's criterion of anomalies neatly, since in Bini imagination its head resembles that of a cock and it crows as it spits venom.[10] Unfortunately, Douglas provides no information on the mamba, which also inhabits Lele territory. Perhaps they attach no special significance to it. Another paradox stems from her typing of the tortoise—on the assumption that her perception is *implicit* in Lele thought—as an anomalous reptile ("its shell distinguishes it from other reptiles, but, as a four-footed creature, it is anomalous in that it lays eggs").[11] It is extremely doubtful that the Lele are aware that the tortoise is a reptile in the zoological sense and that it is kin to crocodile and serpent. That it is an anomalous mammal need be no less implicit in Lele thought: it is four-footed, hairless, and tailed, like the pangolin. Were the tortoise regarded as a mammal, its oviparity would be no less out of character than the hairy, "anomalous" bat's birdlike flight.

The unreliability of psychoanalytic explanations in anthropological studies of religion is apparent from the fortuitousness governing any society's choice of cult species and the metaphors incited by these. A few cases will support this statement:

In the Zapotec and Nahuatl languages of Mexico the bat is called *bagidbicin*

and *quimichpapalotl*, respectively, meaning "rat-butterfly" despite the facts that the symbolism of the bird is no less important in Mesoamerican religions than that of the butterfly;[12] that the bat is a cult animal in its own right; and that the rat is ignored in these religions. Furthermore, Mesoamerican art (especially at Monte Albán, as is clear in figure 52 *a*, *b*) tends to overemphasize the normally rather unobtrusive upper lip of the bat and to model it upon a hieroglyph, or one of its elements, that possesses ophidian associations. The bat's geographic distribution is very extensive in all the tropical and subtropical regions of the world, but only in the Western Hemisphere can one discern its high status in cult. Curiously, this is erratic and seemingly largely due to the blood-sucking vampire bat *Desmodus*.

Bats, as we have noted in chapter 3, are highly venerated in Mesoamerica, but southward, in the Guianas, central Chile, Peru, Brazil, central Argentina, and Uruguay, vampire and other bats evoke no great religious fervor, though they figure in decorative art. Vampires are rather small and attack sleeping persons but very rarely—and then painlessly and without much loss of blood, for their normal prey are other mammals and birds. They may transmit paralytic rabies and a trypanosome that is fatal at times. Their blood-sucking habit alone may be regarded as a sufficient basis for symbol making. Indeed, Huastec iconography in the Gulf Coast region of Mexico includes portrayals of vampires participating in bloody sacrificial rituals.[13]

There is no prima facie reason all not to expect different societies to be impressed by different chiropteran characteristics—and for whatever reason they may fancy. Now, though blood-sucking bats are an exclusively Western Hemispheric genus, in appearance and other respects they generally resemble their fruit- and insect-eating relatives in the Old World. Here, ironically, bats impel no divine symbolism of the kind encountered in Mesoamerica. In fact, it is difficult to identify strong traditions of bat veneration even in North America, outside Mexico. The vampire, as a rapacious creature that thirsts after human blood, is an unjust stereotype of quite recent eastern European folklore rooted in the Slavonic concept of *vámpír*. This word, however, has human (and, be it noted, subterranean) associations very remote from the bat. Historically, it connoted solely vengeful spirits that arose from nondecomposing corpses at nightfall in order to destroy mortals. "Vampire," for bat, is patently post-Columbian usage that affected zoology even later (1774) than its entry into English (1734–41) and other European languages, in which, according to standard lexicographical sources, it simply meant cruel, extortionist persons.

The Wik-mungkan, an Australian Aboriginal group, present another paradox. They advance a complex set of reasons (the details of which are superfluous for us) for the "anomalies" of bats, emus, and marsupials. These stem from Wik-mungkan conceptions of peculiarities of the reproductive anatomy, excretory systems, and other characteristics of these animals—peculiarities that do not, however, qualify them for special attention as sacrosanct species. In initiation rites and myths, particularly those referring to the origins of human beings and bats, Wik-mungkan single out the Rainbow Serpent, not the bat, for the central role.[14]

Stimulated by Lévi-Strauss's proposition that animals are "good to think about," several other anthropologists, among them Dan Sperber, R. Bulmer, and S. J. Tambiah, offer quite conflicting interpretations of societal attitudes

towards animals that excite the imagination of certain peoples.[15] However, they do not focus principally on cult and divinities modeled upon animals. Roy Willis, a structuralist who does consider the numinous value of different species in his search of a generalization, discusses the pattern of veneration in three African tribal societies:

> It is possible to establish that in each society the relation consists of a hierarchy of symbolically significant animals, with one animal at the apex of the hierarchical pyramid: the ox in the case of the Nuer; the pangolin for the Leles; and the python for the Fipa. . . . I argue that these three beasts symbolize for these societies, the ultimate value—what we might call the "meaning of life." If my analysis is correct, what these animals symbolize is, respectively: transcendence of individual personality in pure, inner self-hood; transcendence of individual differentiation in pure communalism; and pure becoming, or developmental change, both social and personal.

One may or may not detect overtones of mysticism, intended or not, in these sentences. Unfortunately, I have difficulty comprehending them and must admit to frequent such experiences vis-à-vis the structural anthropological literature in general.

"To the Fipa," continues Willis, "the python image represents an immortal antagonist without and within; it also appears as a giver and creator of life . . . it embodies the multidimensional structure of the Fipa universe and binds the various levels of experience through the common theme of a unitary process."[16] He does not indicate whether fear figures in any way in the Fipa python cult or in that of other African tribes; indeed, he is unconcerned about the criterion of fear. However, the Ngola and the Togo tribes of Angola, too, regard the python as their supreme cult animal but a dangerous antagonist. Actually, pythons are rarely a threat to human life or to livestock. Nevertheless, the Ngola king avoids intimacy with these reptiles, for they are regarded as a continual threat to his life. As we have seen, a sacred python is "married" to, and looked after by, one of the king's wives, who acts as priestess.[17]

In the River Brass region of southern Nigeria, pythons are so sacred that not only was the death penalty once imposed on tribesmen who molested or injured them, but heavy fines were levied for cutting down the *piridgi,* a creeping plant regarded as sacred because of its resemblance to the python.[18] Clearly, Fipa, Ngola, and numerous other African tribes pay homage not merely to the sluggish, usually harmless python, but to the suborder Serpentes as a whole, for their ophidian mythologies are not built only around the python. Presumably the latter is chosen for veneration fortuitously.

It is doubtful that this reasoning can be extended to other zoological classes and orders in the sense that the veneration of a benign species is motivated by fear or disdain of its dangerous taxonomic allies. The suborder Serpentes is a unique exception, for how can one explain—other than as capriciousness mingled with ambivalent awe and scorn of the serpent—the fact that the prestigious Egyptian goddess Sekhmet, "the violent one," "the powerful one," "the destroyer of enemies," has the head of a lioness in her earliest images and eventually is supplanted (in the cult center at Bubastis) by images of the domestic cat? Renamed Bastet, this benign form of Sekhmet repulsed enemies, specifically "all

male serpents, all female serpents, all venomous animals that would sting the man who has drunk the water consecrated by Bastet."[19] Another case in point is that of the wolf, an animal which until fairly recently ranged widely all over North America southward to the southern end of the Mexican plateau, where it is still not extinct. Mesoamerican religion and art give no hints of its appeal to human feelings. On the other hand, one of the oldest and most important deities of the Mexican plateau cultures, Huehuecoyotl, was modeled upon the shy coyote, though its habits do not differ much from the wolf's. Surely, psychoanalytical surmises that this animal's "fearsome" reputation may have been a deterrent (to a people that venerated the rattlesnake) are not likely to be persuasive.

As a last illustration of the difficulties in formulating generalizations within the purview of structural anthropology, I refer the reader to Godfrey Lienhardt, whose writings fall outside that discipline. His descriptions of religious symbols among the Sudanese Dinka are remarkably detailed, straightforward, and free from theorizing rooted in psychoanalysis. We can here consider, perforce inadequately, only these salient points:

The Dinka have an enormous number of tutelary spirits, or genii, which Lienhardt calls "clan-divinities." These approximate equivalents of the "totems" of anthropological literature are linked to Dinka descent groups. They are usually (but not necessarily) manifest in animals and plants and regarded as the "grandfathers" or ancestors of the descent groups, each of which may be allied with one or a few of these clan-divinities. "The clan-divinities of the Western Dinka alone," writes Lienhardt, "are too numerous to list completely." A few chosen at random will show their variety: gourd, anthill, giraffe, catfish, cattle tick, smallpox, elephant, tamarind and other trees, fire, slowworm, the planet Venus, stone, cattle egret, lizard, hippopotamus, moth, jackal, needle, and grain-eating bird. According to Lienhardt,[20]

> The Dinka have no theory about the principle upon which some species are included among clan-divinities, and some omitted. There is no reason, in their thought, why anything might not be the divinity of some clan. When I asked what I myself should invoke as my clan-divinity, it was half-jokingly suggested that I should invoke Typewriter, Paper, and Lorry, for were these not the things which always helped my people and which were passed on to Europeans by their ancestors? So, clan-divinities are explicitly regarded by the Dinka as representing, for their clansmen, qualities and strength which a man derives from agnatic descent

—that is, they have much the same significance for the Dinka as that which Willis conveys through his expression "the ultimate value . . . the meaning of life" when he describes Nuer, Lele, and Fipa attitudes towards their respective cult animals.

In these contexts, it is noteworthy that Lienhardt draws attention in his index (under "clan-divinity") specifically, and only, to *apac* (a grass), *awar* (another grass), black cobra, catfish, crocodile, excrement, fire, flesh, giraffe, gourd, hedgehog, heglig tree, lion, Malek (a river), sausage tree, smallpox, tamarind tree, thigh, and *wec* (a grass). It is furthermore clear from his text that Dinka in general single out the black cobra, whether this is a clan's divinity or not, as a particularly deadly animal that is associated with "the secret nocturnal

operations of the most powerful witches the Dinka can imagine," who are thought to use its blood and venom to injure their victims.

Certain animals are conspicuously omitted from the Dinka list of clan-divinities. "The most obvious of these," writes Lienhardt, "are the leopard and the buffalo, both of which are frequently referred to in songs and hold great imaginative interest for the Dinka. . . . Unlike the lion, which usually does not attack unless it is first attacked, [these beasts] will pursue and injure men as no other animal of Dinka country does." Why are the aggressive leopard and buffalo not clan-divinities? The Dinka rationalize: "They are beasts which must be injured in self-defense, while the principal rule of behavior towards the emblems of the clan-divinities is that their clansmen should avoid injuring them, particularly shedding their blood." Thus it is odd that the crocodile is a common clan-divinity, though it, too, pursues and attacks people unpredictably. The Dinka, however, rationalize that they are supposed to be able to evade or "control" these attacks.[21] Of the innumerable species of docile antelope, which are a staple of Dinka diet in the dry season, few are deified, and then hardly as strongly as some other creatures, notably the lion and the black cobra.

The information given so far, plus that discussed in previous chapters, warrants these conclusions: (1) Purely descriptive cultural anthropology provides invaluable material for our theme. Its usefulness is curtailed if it is viewed in isolation and greatly enhanced by complementary data from primatology and various branches of the humanities that bear on religion. (2) Structural anthropological approaches, in their present form, are methodologically too constrained to lead to convincing cross-cultural generalizations because, as a rule, the overt manifestations of all animal cults are extremely fickle. Structuralist explanations of this, though prone to subjectivity, are stimulating, even plausible. They seem, however, unwittingly to disregard contradictory data and so appear to be contrived for a foreordained hypothesis. This estimate is strengthened if one is sceptical about the reliability of psychoanalysis, which structural anthropologists perforce inject into their judgments of individual and collective psyche while excluding the many highly complex determinants (beyond semiology and psychoanalysis) that engender unbridgeable cultural differences. (3) These strictures especially affect the cult of the serpent. However, if the diverse expressions of this cult conceal a structuralist element, one is more likely to find it in human biology and protocultural behavior than in ethnological reports.

PSYCHOANALYTICAL PERSPECTIVES

To separate the views of psychoanalytically oriented anthropologists from those of "professional" psychoanalytic psychologists—though their views impinge equally on our theme—may seem artificial, and so to some extent it is. The latter, however, advance extensive arguments in support of their theoretical positions not only on the expressiveness of the human mind, but also on the genesis and relationships of its conscious and subconscious states. Historically, their views have stemmed overwhelmingly from clinical studies of modern Western individuals, both "normal" and neurotic or psychotic, and only very infrequently from direct observations of primitive individuals. A separate treatment of this discipline is mainly for convenience.

It is important to note that, unlike anthropologists, who give it casual attention, eminent psychoanalysts—Freud, Jung, Adler, and their followers—conceptualize the serpent as one of the important symbols constructed by the subconscious human mind. As recognition of the power this animal exercises on man, this is encouraging but hardly edifying, since their assertions concerning the interpretation of the imagery of symbols in general and their origins and functions in society stem from *insight* alone—i.e., from intuitive speculation rather than inductive logic or dependence on *tangible* information of the kind obtained by more rigorous methods such as those of the various sciences, including experimental psychology. The word "insight" occurs so frequently in psychoanalytic parlance that its users seem to claim for it the same value that an investigator in the precise sciences would place upon the accuracy and impartiality of his laboratory instruments. Jung, for instance, relies on insight when asserting that an entire body of myths is represented by a *particular, circular* (graphic as well as conceptual) ophidian symbol, which, he thinks, is interwoven with the "evolution of consciousness."

It is tempting to dismiss such assertions outright, for, whereas some parameters of brain activity are amenable to experimental analysis, Jung's belief is not and must be accepted on faith—or rejected as unanalyzable. It is not possible here to delve into the widely varying interpretations of the nature of the subconscious or unconscious mind and its "symbol-making" potentials favored by proponents of the different schools of psychoanalysis. As a mechanistically inclined biologist, I regard their methodology and inferences, in the examples given here, as questionable and, by implication, poor models for our purposes. I will align myself with the sceptics and recommend a critique by the experimental psychologist H. J. Eysenck, a useful anthology of articles that present (purportedly experimentally verifiable) opposing viewpoints, and a compendium on general psychoanalytic theory.[22] I will, in addition, express agreement with the views of two anthropologists, Edmund Leach and E. E. Evans-Pritchard, the latter especially for his short but scathing rejection of Freud's *Totem and Taboo*.[23] I focus below only briefly upon a few psychoanalytical expositions of ophidian and other pertinent symbols.

It is important at the outset to realize that whereas the word "symbol" connotes in this book an artistic emblem or linguistically decipherable metaphor, the psychoanalytic meaning may, on occasion, be quite different. In psychoanalytic parlance, "symbol" almost always tends to imply a deep—indeed, to many, a *repressed*—emotion manifest in human *unconsciousness* rather than in consciously performed actions. Semiotic terms—the conventionally adopted shorthand for complex ideas, or the "symbols" employed in everyday "conscious" life—are generally called "signs" by most psychoanalysts. Freud, for instance, insisted that symbols of a more or less *universal* character are manifest in subconscious states such as dreams, derive from an experiential observation common to the entire human race, and must be interpreted as such *apart* from the particular associations and experiences of the individual.

The preoccupation of the Freudians with sexual symbols is well known. One of Freud's foremost followers, Ernest Jones, explains that "the idea of a snake, which is *never consciously associated with that of the phallus,* [my italics] is regularly so in dreams, being one of the most constant and invariable symbols: in primitive religions the two ideas are quite obviously interchangeable, so that it

is often hard to distinguish between phallic from ophitic worship . . . very rarely can it also symbolize the intestine and its contents, but as far as I know, nothing else."[24] The italicized part of this assertion, however, is contradicted in religious art, all of which is consciously created. The examples are innumerable, but two will suffice: One of the iconographic attributes of the important Hindu god Śiva is the cobra. Normally conceptualized as a girdle on his shoulders or hips, the cobra is portrayed in abstract forms of his icons coiled around the god's quintessential attribute—his *lingam*, an isolated stone or metal cylinder that represents his phallus. In the Ikuru cult of Nigeria, the ceremonial drum (also called *ikuru*) typifies the prominent status of the serpent. Carved on this drum, it represents the phallus and connotes ancestors and procreation. It is placed next to the carving of a tortoise, which represents the vagina, and whose neck and head represent the clitoris. Serpent and tortoise have symbolic positions in the shrines of the male and female deities, respectively.[25]

How strong is the tendency to perpetuate the conventional Freudian emphasis on the serpent as dream symbol to the exclusion of other species is illustrated by Róheim's writings on the dreams and myths of Australian Aborigines. Though a follower of Freud, Róheim often opposed and modified the master's ideas; but, in describing the Australian situation, he does not explain why the lizard[26] and other animals, despite high mythic importance in aboriginal traditions, are of little or no value in Freudian theory. Yet they are, like the serpent, part of the dream state, recur in Aborigines' dreams, according to Róheim, and (in Freudian theory) are derived from "experiential observation common to the entire human race." Róheim's descriptions of the animal subjects of these dreams mention no attempts at frequency or other analyses that form part of, and support, his speculations on Oedipal symbolism; but this is hardly surprising, for the qualities of an animal per se and their influence on the mind are never the subjects of interest in psychoanalytic writings.

"The *snake*," writes Adler on the subject of dreams, "is one of the most pregnant symbols of the unconscious, so much so that it often stands for the unconscious itself . . . it is the personification of the earthly unconscious, of the instinctual layer, with all its secret, mantic, and curative powers as well as its inherent dangers which must be overcome. It is precisely this which explains the venerations and fear inspired by the serpent."[27] The salient feature of this assessment is that it is not so much the animal per se that infuses fear (a fact which, of course, he does not deny) and, through fear, impels supernatural beliefs and veneration but rather that supernatural qualities *unconsciously* attributed to it by an individual are the explanation, i.e., causes, of his awe and fear. This is clear from Adler's last sentence, which is consistent with psychoanalytic psychology's preoccupation with deciphering dreams or erecting symbols in order to formulate, through insight, what modern neurophysiology despite its powerful resources regards as one of nature's most refractory secrets: the intangible parameters of visions produced by biochemical activity during sleep or under the influence of psychedelic drugs.

Thus, Adler's logic and methodology are no more persuasive than Freud's; indeed they are semiological in the literal sense that semiology is a branch of pathology concerned with symptoms, since psychoanalytic psychology's tenets derive their inspiration from psychotherapy, from the clinic, from the "abnormal" subject. Words like "orally devouring and anally castrating" are its com-

monly used means of describing the mother who is domineering and "dangerous." The patient's problems are frequently identified with "sexuality," "pregenital, anal-sadistic phase fixation," "hostility to the hatred, anally castrating mother," etc. An animal is often regarded as if it symbolized the anxieties, fears, and dangers imagined in situations like these. Adler himself describes dreams against a background of *European* mythology, dreams in which bears and wolves loom prominently, even displacing the serpent. "Animals express the instinctual libido, and in general, the unconscious. But why in particular a bear, a wolf, and a snake?" asks Adler.[28]

Adler's trio might well share the company of elephant and spider. Two psychoanalysts project these animals so strongly that one may well ask why Freudians and Adlerians do not treat them and other species on a par with the serpent as symbols of the unconscious: R. Ransohoff's insight leads her to believe that the elephant "appearing initially as part of a nightmare . . . represents the patient's anxiety related to aggression."[29] Writing on the function of animal symbolism in religion and mythology, she invokes the usual psychoanalytical notion of a "universal unconscious recognition of the meanings of certain symbols, such as the elephant."

M. Sperling, on the other hand, focuses upon the spider:[30]

> Spider symbolism as well as the symptoms most frequently found associated with it, such as severe sleep disturbances and phobias, are also an indication of unresolved separation conflict and a high degree of ambivalance which intensifies bisexuality and the problem of sexual identification. The mechanisms of defense employed in spider symbolism and in phobias are denial, externalization, projection, splitting and displacement. They indicate the primitive, ambivalent, narcissistic ego organization of this phase. The personalities of these patients and in the mothers, in cases where it was possible to study them, showed marked paranoid trends. They also used psychosomatic symptoms in stress situations, either episodically or more persistently for the immediate (somatic) discharge of threatening impulses. The spider symbolism in most cases remained latent and became manifest in traumatic life situations and in analysis when the phobic and psychosomatic defences were invalidated. In the analytic situation the spider symbolism was indicative of a specific mother transference.

Evidently, to Sperling, the spider is a powerful latent symbol embedded in the subconscious mind, but, symptomatologically, its associations seem to be little different from Ms. A's ophidiophobia, described in chapter 5. In the unconscious state, it reflects (in psychoanalytic theory) a form of defense produced by some personal, domestic problem more acute than any actual threat from, or fear of, spiders. Psychoanalytic symbolism of the spider (or serpent, or any other "fearsome" animal) has little to do with the normal tendency of perhaps the overwhelming majority of persons, who—though unsullied by "mother hatred," "marked paranoid trends," "psychosomatic defenses," "sexual identification" problems, and the like—harbor mild to acute, if transient, fears of real spiders (or serpents) but never or rarely dream of them. Psychoanalysts, I am inclined to believe, do not in any way clarify why *any* animal visualized in dreams or nightmares should not displace the serpent from the favored status traditionally accorded to it in the literature of "depth psychology."

In the writings of Jung and his protégé Neumann, the serpent is singled out

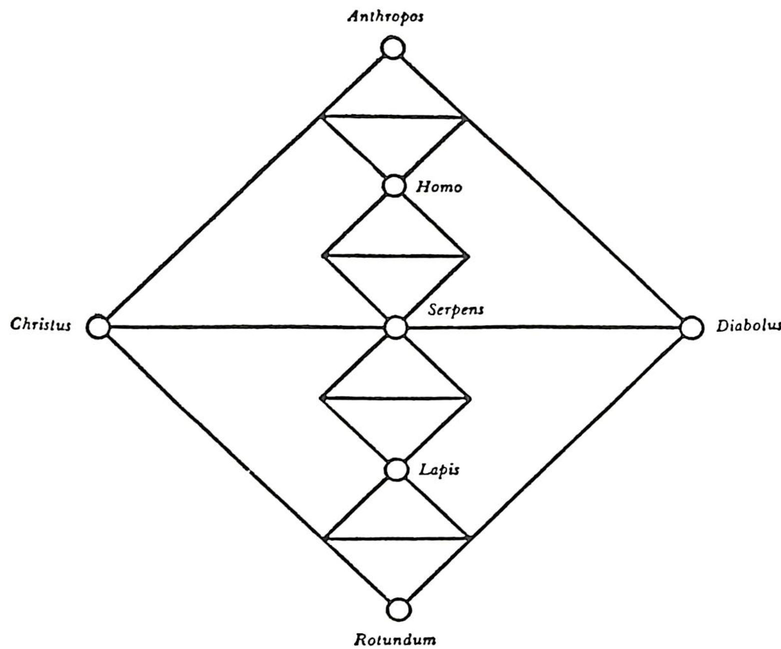


Fig. 105. C. G. Jung's diagram illustrating his concept of "Quaternios". In this system, which involves oppositional pairings, a central place is reserved for the serpent—Jung's symbol of "the point of greatest tension between the opposites."

more emphatically than by adherents of other schools of psychoanalysis. Furthermore, it is accorded a crucial significance to the extent of invoking "biological facts." These, unfortunately, do not aid our comprehension—indeed, persons with a grounding in the biological sciences are likely to view their assertions with dismay. I quote below a few extracts to illustrate this as well as the core of their ideas, which revolve around the concept of "archetypes" and the "collective unconscious."[31]

According to Jung, "the crab is not a personal experience, it is an archetype . . . I hold that representations of psychic facts in images like the snake or the lizard or the crab or the mastodon or analogous animals [*sic*] also represent organic facts. For instance, the serpent very often represents the cerebro-spinal system, especially the lower centres of the brain, and particularly the medulla oblongata and spinal cord. The crab, on the other hand, having a sympathetic system only, represents chiefly the parasympathicus of the abdomen; it is an abdominal thing." Referring to the graphic scheme of figure 105, showing a series of "Quaternios" (of interest to structural anthropologists for the oppositional pairings it involves), Jung emphasizes

> the point of greatest tension between the opposites, namely the double significance of the serpent, which occupies the centre of the system. Being an allegory of Christ as well as of the devil, it contains and symbolizes the strongest polarity into which the Anthropos falls when he descends into Physis. The ordinary man has not reached this point of tension: he has it merely in the unconscious, i.e., in the serpent. . . . Most people do not have sufficient range of consciousness to become

> aware of the opposites inherent in human nature. The tensions they generate remain for the most part unconscious, but can appear in dreams. Traditionally, the snake stands for the vulnerable spot in man: it personifies his shadow, i.e., his weakness and unconsciousness. The greatest danger about unconsciousness is proneness to suggestion. The effect of suggestion is due to the release of an unconscious dynamic, and the more unconscious this is, the more effective it will be. Hence the ever-widening split between conscious and unconscious increases the danger of psychic infection and mass psychosis. With the loss of symbolic ideas the bridge to the unconscious has broken down. Instinct no longer affords protection against unsound ideas and empty slogans. Rationality without tradition and without a basis in instinct is proof against no absurdity. . . . In the *lapis*, the counterpart of man, the opposites are so to speak united, but with a visible seam or suture as in the symbol of the hermaphrodite. This mars the idea of the *lapis* just as much as the all-too-human element mars *Homo sapiens*. In the higher Adam and in the rotundum the opposition is invisible. But presumably the one stands in absolute opposition to the other, and if both are identical as indistinguishable transcendental entities, this is one of those paradoxes that are the rule: a statement about something metaphysical can only be antinomial.

It would be unfair to represent Jung through this brief (and, to some, perhaps unilluminating) extract from his voluminous writings.[32] I therefore refer the reader to a concise discussion of Jung's "archetypes" by J. W. Redfearn, who explains the ideas contained specifically in figure 105 in these terms: "The self can appear in all shapes from the highest to the lowest. The upper levels here refer to the spiritual, below this the human, then the spinal or reflex, then the inorganic, then the atomic, where psyche and matter will once more one day prove to be one."[33] Be this as it may, I shall postpone comment until after we learn more from Neumann's view of the serpent, since Jung praises it highly.[34]

To Neumann, it is not the mere animal but the *circular* bodily configuration of the serpent that constitutes the ideational foundation for hypothesizing on the "evolutionary history of human consciousness [and for representing the world's mythologies as] the phenomenology of this same evolution." Moreover, this history hinges on "the pictorial forms of the instincts . . . [Jung's] archetypes or primordial images . . . fantasy images rooted in the collective unconscious . . . as in dreams." It is, he asserts, "the germ cell of creativity, living the cycle of its own life . . . the circular snake, the primal dragon of the beginning that bites its own tail, the self-begetting *Ouroboros*" (see figs. 35 and 39 *a, b*).

Neumann suggests that the attributes of ouroboros lie beyond the reckoning of modern biochemistry and developmental biology. Both qualitatively and quantitatively, experiments in these fields long ago established our knowledge of an orderly sequence of embryonic events, from the single-cell stage onward, involving complex molecular mechanisms promoting the adhesiveness of functionally and structurally similar cells belonging to a variety of distinct but physiologically integrated tissues like nerve, muscle, bone, blood, etc. The fully differentiated multicellular organism is but the *product* of these complex biochemical activities of cells in mitotic division. To the contrary, Neumann tells us that organisms at the "uroboric level of unconsciousness" are characterized by "centroversion"—a term untranslatable to make biological sense, though one is told that it is (italics mine) "the innate tendency of a *whole* to *create* unity within its *parts* and to *synthesize their differences* in unified systems . . .

[to] *promote* cellular aggregation and facilitate the harmonious working of different cell tissues [*sic*], organs and so forth."

In view of the central importance of Serpens in "Quaternios" (see fig. 105), Neumann's description of ouroboros is noteworthy. This circular serpent

> slays, weds, and impregnates itself. It is man and woman, begetting and conceiving, devouring and giving birth, active and passive, above and below, at once. . . . It is the symbol of individual psychic development signifying the roundedness of the psyche, life's wholeness, and perfection regained. It is the place of transfiguration and illumination, of finality, as well as the place of mythological origination. [It personifies] the undeveloped germ of ego consciousness [that] slumbers in the perfect round and awakens. . . . [It is the abode of] prenatal time, [of] unconscious envelopment, [like] swimming in the ocean of the unborn.

The ouroboros, according to Neumann, has "alimentary" and "metabolic" aspects and represents not only the "round container, i.e., the maternal womb, but also the union of masculine and feminine opposites, the World Parents joined in perpetual cohabitation. . . . Uroboric incest is a form of entry into the mother, of union with her . . . the emphasis upon pleasure and love is in no sense active, it is more a desire to be dissolved and absorbed, passively one lets oneself be taken, sinks into the pleroma, melts into the ocean of pleasure. . . ."[35] And, in the same vein, there is much more that one must read in the original to ascertain whether Neumann's prose and ideas exemplified here are incomprehensible out of context or intrinsically meaningless.[36]

To sum up: It is not easy to comment on assertions so earnest as those in the above quotations without reference to methodology, for my goal is not a disquisition on the entire discipline of psychoanalysis. Nevertheless, its adherents sift their hypotheses on serpent symbolism from one of the most refractory of raw materials—the human mind. It is understandable but unfortunate that the only apparatus their discipline allows them for this purpose is insight, a device too pliant to any hypothesizer's idiosyncrasies to be equated with the instruments of science. Psychoanalysts, of course, imply that their insight has the qualities of logic and discriminative penetration. Scientists, mechanistically inclined biologists in particular, are apt to question this assumption. I have, therefore, little choice but to refer the reader to more detailed psychoanalytic theory involving the serpent so that he may judge independently whether pronouncements of the kind I exemplify above are warranted by the type of data that prompts them.

I take account of the psychoanalytic perspective for three reasons: First, in order to stress that, ironically, Jungian (and, to a much lesser extent, Freudian) ideas superficially resemble those advanced in this book: the involvement of visuo-motor and other reflexes ("the unconscious psyche" of Jung); specific, often recurring visual images constructed by the subconscious mind (the approximate equivalents of Jung's "archetypes"); the evolutionary background (in Jung's words, "as the body is a sort of museum of its phylogenetic history, so is the mind"); the influence of the physical environment on an individual's innate fears and emotions (to Jung, "it is only individual ego-consciousness that has forever a new beginning and an early end"); and the subservience of social factors (Jung's term "the collective unconscious" connotes the "all-controlling deposit of ancestral experience from untold millions of years, the echo of prehis-



Fig. 106. "Ouroboric hermaphrodites"?: *a*, medieval Celtic stele, Valley of Oo, France, portraying a serpent ("penis"?), hatched from an egg ("vagina"?), in the act of fatally biting the breasts of a "god"; *b*, wood carving, ca. seventeenth century, a cobra issues from the vagina of a Hindu divinity; the symbolism is too complex to be explained away psychoanalytically without reference to the historical and philosophical background of Hindu iconography.

toric world events to which each century adds an infinitesimally small amount of variation and differentiation").[37] All these are remarkable parallels in biological and psychoanalytical theory, but they are fortuitous. Jungian theory derives not from modern biological knowledge or recourse to the scientific method, but from the far greater latitude for speculation ("insight," including subterfuge in specious "biological" arguments) available to dialecticians. Thus it is the differences in the data, in the trains of thought, in the presence or absence of inductive logic, and in the vehicle of language that the reader must ultimately consider in approving or disavowing the principles of biology and psychoanalysis insofar as they impinge upon the cultural aspects of serpent veneration.

Second, I do not begrudge psychoanalysis, on a local scale, in ethnological

studies. Its applications and limitations under particular circumstances are the concern of the individual investigator, who, indeed, may reach reasonable as well as useful conclusions with its aid. However, I stress the hazards of extending this aid to structural anthropological generalizations, for these, in my view, are virtually indistinguishable in reasoning from the generalizations of the various schools of psychoanalytic psychology, even when anthropologists modify their procedures and play down their debt to those schools.

Third, anthropologists vary in forthrightness in the latter regard, and the tendency to invoke Freud rather than Jung is also more apparent. Willis, though his conclusions on animal symbolism seem questionable or unintelligible to me, correctly remarks that it would be premature to accept Freud's model of the human psyche as universally valid.[38] Douglas, whose admiring words about Freud I quoted earlier, does not invoke his ideas in discussing animals in Lele religious symbolism but cites him several times on the sociology of jokes and, once, in questioning Lévi-Strauss on myth.[39] A succinct estimate of Freudian influence on the latter's views on myths involving animals is given by Leach.[40] Among anthropologists who rely explicitly on Freudian precepts and terminology is La Barre, who fully illustrates my point about hazards. To him, as we have seen, the genital symbols and ophidian myths of various cultures were prompted by a rearing serpent's erect posture and especially by the expansion and collapse of the cobra's hood, which, he alleges, correspond to the erection and detumescence of the human penis. Freud, I would remind the reader, claimed to have found a purely sexual symbolism in dreams of staircases: climbing them symbolized erection, and descending them symbolized detumescence after orgasm.[41]

THE HOLISTIC PERSPECTIVE

One would think that findings in psychoanalytic psychology and psychological anthropology were amenable to close interdisciplinary contacts between the two fields to the extent of permitting unified structuralist generalizations. Actually, the barriers that separate them, as Douglas Price-Williams and R. B. Edgerton indicate, are many. According to the latter, most cross-cultural psychologists are committed to experimental procedures, whereas most anthropologists whose research involves psychological data are fundamentally opposed to experimental procedures.[42] The difficulties are severe in studies that oblige an investigator to penetrate linguistic oddities that impede understanding of the "logic" of primitive peoples' thoughts and explanations of beliefs. Price-Williams illustrates this with reference to Lienhardt's findings on the Sudanese Dinka and his own on the Tiv of Nigeria and draws attention to several other societies, such as the Zande of eastern Sudan, the Ojibwa of North America, and the societies of Tahiti and Antigua, to name a few. The general problem of comprehending the anomalies and "non-standard logic of magico-religious thought of primitive peoples" is discussed by D. E. Cooper.[43]

Assessing a society's psyche on the basis of its individual members' dreams—a phenomenon that interests anthropologists and psychoanalysts equally—presents another formidable interpretational problem. Rarely, if ever, are these findings related to knowledge obtained from experiments on the

physiology and psychobiology of dreaming, particularly about the stimulation of drugs or the stresses of daily life. The studies of Louis Breger, Ian Hunter, and Ron Lane on hospital patients awaiting surgery touch upon the importance of this and ancillary factors, including presleep experiences, the persistence of dream patterns laid in early childhood, and the potentiating effects of emotional feedback.[44] I have earlier outlined the biological significance of the last of these factors with reference to the hormones epinephrine and norepinephrine. Thus dreams that are evaluated without reference to their root causes (whose understanding lies partly in the domain of the experimenter) have limitations comparable to those imposed by linguistic barriers. One gains access to another person's dream indirectly through a report but can never fully understand its complex relationship to the dreamer's hazy, and sometimes quickly erased, memory of experiences that may actually have incited the dream.

Now, studies of the influence of hallucinogenic drugs in altering an organism's level of consciousness have an important bearing on the subject of latent emotions, for dreams and drug-induced hallucinations appear to be essentially similar in origin and very probably are connected with memories of recent as well as remote happenings.[45] Experiments with emotion-releasing drugs can open profitable avenues bearing on the question of social transmission and reinforcement of rites and beliefs by hierophants. Recent inquiries into the pharmacological implications of drug consumption in ancient Egypt and Mesoamerica aptly underscore this aspect.[46]

Thus we may now focus afresh on the hallucinogenic plant extract, *ayahuasca* (or *yage*). In certain tribes of the Peruvian western Amazon, whose shamans use it ritually, this drug produces—consistently, and as the primary effect—terrifying visions of attacks by vipers, boa constrictors, anacondas, and fearsome forest creatures like the jaguar. Systematic anthropological studies show that it elicits identical effects in urbanized tribal emigrés. What is more remarkable is that harmaline, the pharmacologically active component of *ayahuasca*, produced similar, recurring visions in urban Chileans of European descent who were studied experimentally.[47] These Chileans were aware neither of the effects normally associated with the drug nor of its connection with *ayahuasca* and its consumption by forest-dwelling Peruvian indigenes. Whether their hallucinatory visions of reptiles and wild felines transcend the factors of personal experience and social conditioning is unknown, for memories of pictures or descriptions of the forest acquired through reading or television may have played a part. The point, however, is that the pharmacologically active component released in them the emotion of fear just as effectively as the natural plant product does in primitive tribal rites. This is not to imply that particular drugs produce particular visual imageries, but only to indicate the rewards of experimental approaches. Modern drugs that produce fearsome visions, or euphoric ones, in general, are well known.

One of the traits that separates anthropoid apes from man, it is often said, is the latter's symbol-making propensity. This seemingly reasonable criterion encounters disturbing contradictions not only in modern experimental studies of "symbolic" signaling by chimpanzees and other nonhuman primates,[48] but also in the world of intrusive memories and symbols—the world of dreams. The characteristics of neurophysiological events occurring during sleep are, in every

essential respect, precisely identical in monkeys, apes, and humans, to the extent that experimental evidence of dreaming has been obtained from behavior responses of rhesus monkeys.[49]

Systematic studies of human subjects reveal that fear and anxiety (more than anger) are most often mentioned whenever the vivid details of dreams linger after sleep. Even bland dreams with emotional overtones tend to be unpleasant about 65 percent of the time. Admittedly, these are approximations that stem from obscure variables, but they are not devoid of a sound neurophysiological basis: The adrenal hormones epinephrine and norepinephrine, which in the fully awake individual normally signal fear and anger, respectively, are also secreted plentifully into the blood stream during certain phases of sleep—the rapid eye movement (REM) and the so-called D-state (REM-EEG)—that signal the onset of vivid, recallable dreams, bodily changes involving the electrical pattern of brain waves, increased rate of breathing, etc. Clearly, hallucinogenic drugs have much potential in studies involving the deliberate release of deep-seated emotions that are interwoven with personal biases and find a vent in the imagery of visions during a state of full or semi-consciousness. These biases, one may reasonably assume, are inseparable from a person's propensity for symbol-making during complete wakefulness. Intensive experimentation on human subjects, however, involves many drawbacks despite the great advantage of accurately recording the scenery of drug-induced visions directly from oral accounts. Nonhuman primates are more pliable, as the ingenious combinations of experimental psychological, electrophysiological, and mechanical techniques used in sleep and dream research demonstrate.[50] In this respect, psychoactive plant products and synthetic drugs are more likely to elucidate the mystery of the retrieval of long-term memories of objects envisioned in dreams than is possible through semiological speculations on the "meanings" of animal symbolism.

The limitations of such speculations are illustrated by the common human tendency to conceptualize opposites—light vesus darkness, knowledge versus nescience, sky versus earth, etc. Oppositional pairing in general is well documented in Lévi-Strauss's writings on the myths of primitive peoples, whose choice of animal species as metaphors in such pairings is quite idiosyncratic. Psychoanalytical anthropology can offer no convincing theory as to why different ethnic groups so very often conceptualize the bird, the only prominent denizen of the sky, as the antagonist of the serpent. Why do they tend to overlook a great many other terrestrial species such as small mammals, worms, and insects, which the majority of birds normally prey upon?[51] The psychoanalytic approach fails because it has neither explored nor shown much concern with the serpent's special appeal to man's nervous sensitivities—his elementary susceptibility to its *fascination*, which is better understood in the biological terms already outlined. The word "symbol," in biological contexts, presents none of the semiotic problems that anthropologists and psychologists alike must contend with. The serpent, one may conclude, impels "a mode of thought" not merely because its actual perceived presence may induce revulsive visuo-motor effects in an individual, but especially because human societies foster disdainful memories of this animal (even when the local fauna is deficient in it) more tenaciously than of most other species and vent their emotion in the most capricious ways through art and myth.

In other words, impulse and emotion *motivate* a society to invent ophidian myths and symbols—through intellect. This is contrary to Lévi-Strauss's otherwise supportable remarks on Durkheim's theory of the collective origin of sacred symbols: "Actually," concludes Lévi-Strauss, "impulses and emotions explain nothing; they are always results, either of the power of the body or of the impotence of the mind. In both cases they are consequences, never causes. The latter can be sought only in the organism, which is exclusive concern of biology, or in the intellect, which is the sole way offered to psychology, and to anthropology as well."[52]

My dissatisfaction with structuralist generalizations that are parochially rooted in psychoanalytic psychology and psychological anthropology is obvious. However, I recognize that there are aspects of human nature that lie beyond the pale of the pure sciences. Some of these aspects, such as "active imagination," a term used by Jung for his technique of drawing out the emotions of his subjects,[53] deserve serious notice. I am inclined to agree with Michel Foucault's perspicacious remarks about psychoanalysis and ethnology that

> no human science can be sure that it is out of their debt, or certain of not being beholden to them in one way or another . . . since they span the entire domain of [that] science, spread their concepts throughout it, and animate its surfaces. . . . [Yet] despite their quasi-universal "bearing," they never, for all that, come near to a general concept of man: at no moment do they come near to isolating a quality in him that is specific, irreducible, and universally valid wherever he is given to experience. The idea of "psychoanalytic anthropology," and the idea of "human nature" reconstituted by ethnology, are no more than pious wishes.[54]

I need only qualify my agreement with Foucault by reminding the reader that the reconstitution of "human nature" from a biological standpoint involves far fewer impediments than are encountered in ethnology. This is evident enough from the examples I have given of seemingly endless and *unpredictable* differences in cultural biases.

Some prehistorians emphasize the limitations of, or reject, ethnographic analogies as an aid to interpretation of archaeological data. Gordon Childe and André Leroi-Gourhan, for instance, have held that no existing society is exactly like a prehistoric one and that the endless variety and diversity of present-day primitive societies suggest several possible explanations of the archaeological material. Details of this controversial topic are given by B. Orme, who reviews both sides and presents powerful arguments of several, among them Lewis Binford, who disagree with these prehistorians. Binford holds, I think correctly, that, rather than starting with an archaeological problem and searching ethnographic literature for possible solutions, as the majority of prehistorians do, it makes more sense to start with a facet of human cultural behavior and then study its archaeological as well as ethnographic aspects. This approach, maintains Binford, is not tantamount to analogizing, but a unifying device that assists those prehistorians who do favor the use of ethnographic parallels. Orme's own conclusion is that this awareness only provokes a wide range of possible interpretations of human cultural response that could "finally promote archaeology from a treasure-seeking status to that of a serious contributor to the historical and social sciences."[55] The injection, whenever possible, of pertinent

biological (especially evolutionary) data, I might add, narrows down the range of interpretations and, furthermore, reduces doubts as to the propriety of ethnographic and archaeological comparisons. In this sense, my holistic approach is unprecedented and perhaps more rewarding than parochial ones.

The question still at hand is one which involves the emergence of clearly identifiable ophiolatry. We do not have, and never will obtain through archaeology, the material evidences of the very earliest animal-centered cult practices, for they are concealed in dim and distant periods of antiquity. We may presume that serpents provoked some form of respect and, even more, ophidiophobia wherever mankind had spread long before the origins of civilized societies. It is, however, the artistic and literary records of ancient civilizations and their successors that provide much of the concrete evidence that one is liable to overlook if one is preoccupied with the "primitive mind." Thus the historical aspects of the emergence of the religions of civilization from primitive religious myths are important in any holistic approach to the origins of cult practices. Archaeologists and historians who reconstruct events in the transmutation of Palaeolithic hunters and gatherers into settled, civilized agriculturalists are many, but few seem to have devoted attention to religion along the lines adopted by Rushton Coulborn.

Coulborn posits that each of the seven primary, regional civilized societies—the Mesopotamian, the Egyptian, the Indian, the Chinese, the Cretan, the Mesoamerican, and the Andean—had, either at its absolute origin, "whatever and whenever absolute origin may be thought to have been, or quite soon afterwards, a new religion, even if constructed always in part out of old elements, and charismatic leaders who propounded it and played a large part in the early affairs of the society."[56] It is important to be aware that, in general, there are certain significant resemblances amid the differences in thinking between uncivilized and civilized societies, but these are beyond our purview. Suffice it to say that Coulborn's view is supported by surviving myths and, often, by archaeology. Three important points in this view are that culture diffusion had nothing to do with the origin of the primary civilized societies, or any civilized societies; that the diffusion which was important to them was the diffusion which occurred before their origin, spreading many Mesolithic and early *agricultural* practices over large regions; and that this has no direct bearing on the origins of civilized societies, as is supposed by some who regard Mesopotamia and Egypt as not only the seats of the earliest civilizations, but also the fount of major cultural acquisition of other civilizations. The key achievement of man prior to civilization was agriculture.

Few will contest this; indeed, the same broad points have been made in one way or another by others, including me. A salient point Coulborn and I stress, however, has to do with religion and charismatic leaders, whom I have called hierophants, consistent with their determinative spiritual role in all societies, primitive as well as primary civilized. The origins of the latter, as almost everyone seems to agree, coincides with regional migrations of closely related ethnic groups—"primitive" in their thinking and not quite out of the hunting-and-gathering stage but possessed of a low-grade agriculture—who, driven by the increasing desiccation of the Mesolithic, conglomerated in the basins of major river systems or on other agriculturally inviting land. Here they settled permanently, improved their agricultural skills, increased greatly in population and

material wealth, and built anew upon the foundations of their ancestral religions. In post-Mesolithic times, as in Kampuchea and parts of Mesoamerica during the first millennium A.D., iconography betokening the veneration of animals flourished even in tropical forests cleared for ceremonial centers, if not primarily for agriculture, though this may have been supported on a restricted scale.

It is, in these contexts, heartening that Coulborn singles out the serpent (and only incidentally, felids, but no other species) for its evident impact upon the religious myths of all the seven primary civilized societies. And though his remarks in this respect are very fleeting ones, he is rightly critical of as yet quite unsubstantiated claims regarding trans-Atlantic and trans-Pacific culture diffusion to the New World in the early pre- and post-Christian era, and he correctly relates the cult of the serpent to a background of seasonal aridity, the sun, rainfall, and agriculture.[57]

Thus we have come full circle to the idea expressed early in this work: the hierophant's role in fortifying a society's ambivalent disdain and awe of the serpent and the incentives that periodic changes in weather and climate provide through their effects on reptilian activity. Serpents encroached upon higher, dry ground and into human habitations, especially after being flooded out of their holes, eons before agriculture was practiced.[58] It is hardly surprising that sun, rain, and serpents are recurring subjects in the religious and cosmogonic beliefs of the most diverse aboriginal peoples, even in the colder zones. The Kwakiutl believe that the sun, who wears the mask of *sisiutl*—the mythic serpent "created in the beginning of time"—passed that mask on to clan ancestors. The supreme deity Ätquntäm is solar and has ophidian associations, according to the related Bella Coola, who fear serpents in general because they are associated with a deadly supernatural human being, Atlät-iaitt, who lives in the Underworld.[59] The Siberian Evenki shaman follows the course of the sun as he chants about his serpent ancestress.[60] The Fon of Dahomey, the Bambuti and Baluba of the Congo, the Makara of the Sudan, the Tswana of Botswana, and the Bushmen of South Africa directly equate serpents with rain in myths and rainmaking rites that reflect a common African sentiment.[61] Rain appears early in Baluba creation myth; its "greatest desire was to fall down and inundate the earth." The Baluba believe that the world's first human inhabitant had two wives—one human, the other, her senior, a serpent named Kizimu.[62] The Rainbow Serpent myth of the Australian Aborigines is a product of the violent rains and thunderclouds of the northern Australian monsoon. The details vary, but in essence this immensely powerful and important monster spends the dry season resting in a deep waterhole and emerges as a rainbow in the wet season. Known as *ungud* or *wondzad*, this ancestor-serpent contained the bodies of the first Aborigines and the natural features of the land as well. To offend it is to invite waterholes to overflow and drown everyone. Not unexpectedly, the Australian Aborigines' god of rain and fertility is named Wondjina, and he has several repercussive associations with *wondzad* (or *ungud*), the word not only for Rainbow Serpent but for a particular species of python.[63] Certain sacred ceremonies also involve myths of fearsome "Serpent-Beings," the killing of which will dry up springs.[64] Fear and awe, indeed, are implicit in beliefs like those of the Canelo Jibaros of Amazonia, to whom the rainbow is a huge boa whose gaze must be avoided by menstruating women lest he impregnate them;[65] in the great inundation myth of

the Araucanian Indians of Chile;[66] in the association of the rattlesnake and the thundergods by the North American Cherokee; and in Hopi-Zuñi tales of children imploring their "uncle," a water serpent, to check the flood he has caused.[67] Evidences like these are inexhaustible in aboriginal religious and secular lore.

It is scarcely necessary to delve deeper into pluvial and cosmogonic myths. I have recorded several more, in rather greater detail, earlier. However, the following few statements will refresh the reader's memory and enable us to terminate this survey on a suitable note: References to the cudgeling of a serpent at sacrificial altars, to stop incessant rain, occur in the Honan oracle-bone inscriptions of Shang China.[68] Through most of recorded Chinese history, shamans "produced" rain first by cajoling, then in desperation threatening, clay images of the local deity, which was almost always the *chiao* dragon. In South China the word "rainbow" is equated with the glyph "serpent."[69]

Serpents, usually cast as horrendous creatures, and moisture are practically inseparable in the religious traditions of all the primary civilized societies. The Hindus have a prayer that beseeches Prithvī, the goddess Earth, not to unleash serpents and creeping creatures after a torrential rain and also have a deity, Ahi Budhnya, the "Serpent of the Watery Abyss." Indeed, it was customary, before building a house, to divine the exact spot of ground where the master mason should thrust a piece of skin under which to lay the first foundation stone at an angle leading to the "Center of the World"—a symbolic gesture that imitated the rain god Indra's primordial act of "striking the serpent in its lair" and "crushing its head" with his characteristic weapon, the thunderbolt.[70] The Sumerian creatures of Kur are water-dwelling serpents; so, too, are the evil Tiamat and her brood, "sharp of tooth, unsparing of fang, with venom . . . the begetters of the great gods" of Babylonian creation myth.[71] The Pythian Vale of the Greeks takes its name from the python dwelling in the slime from which Earth arose. In Mesoamerican traditions, Q'uk Kumatz, "Heart of the Lake, Heart of the Sea," is a serpent that appears very early in the first of four sequences of creation legends in the Popul Vuh.[72] In Andean myth, Yaurinkha, Huayra-tata, and Amaru are malignant, lake-dwelling, storm- and rain-producing ophidian deities. The double-headed Amaru was so highly regarded that even though it was vengefully stabbed, Andean Indians in early Spanish colonial times used to scrape and pulverize for medicine a rock which, according to local belief, represented its petrified body.[73]

Ophidian myths seem to have received a fillip under circumstances peculiar to the sociocultural and religious development that characterized all the primary civilized societies during the Neolithic and Chalcolithic periods. The circumstance that they were all grain-producing societies cannot be minimized as a factor directly affecting that development, nor can the influence of religious leaders and the deities connected with agriculture and animal husbandry. Among the most important Sumerian goddesses who were probably worshipped in the protoliterate period and bore the epithet "old" are Nisiba of Eresh and Nunbarshegunu of Nippur. The former took her name from *nisaba*, "grain," while the latter's name contains the Sumerian word for a kind of barley.[74] Whether or not they were ophidian I have not been able to ascertain, but Inanna, certainly the most prominent of Sumerian goddesses, had pluvial aspects and ophidian (and leonine) epithets. All three goddesses, and the ophidian god

Ningishzida, were closely tied to the prosperity of crops and livestock. The Egyptians conceived their goddess of grain, Renenutet (or Ernutet), as ophidian.[75] The "corn-mothers" of Cretan and Greek mythology, Demeter (Deo) and Kore (Proserpina), had ophidian attributes.[76] And in Mesoamerica, the goddess "seven-serpent" Chicomecoatl and her alternate aspect, Xilonen, personified the mature and the young maize plant, respectively.

The sociocultural pressures under which grain-producing societies developed are difficult for us to imagine accurately. It is possible that their normal ophidiophobic tendencies were in part aggravated by the primitive conditions of grain storage in their burgeoning settlements in the wake of the agricultural revolution and the marked increases in population during the Neolithic and Chalcolithic, which meant an increase in the population of rodents and, in turn, serpents, their predators. Ancient glyptic art includes many depictions of sheep, goats, cattle, and men, alongside serpents.[77]

Long before they utilized a script to record their religious sentiments, Egyptians and Nubians of the predynastic Naqada I period (ca. 3500 B.C.) produced from Nile mud a distinctive fine brick-red burnished pottery, with the tops blackened on the outside, the insides wholly black. Innumerable specimens of this earthenware are known. They come in a variety of shapes, but almost all of them are devoid of ornamentation. It is of interest, therefore, that though animal forms are "very rare," the serpent looms prominently in low relief on a large vessel (fig. 107) and that in other specimens of Naqada I pottery a scorpion and lizard are, to my knowledge, the only other animals depicted in relief.[78]

Whether or not the emblem on the vessel in figure 107 represents any particular ophidian deity is unknown. It is noteworthy, however, that in Upper Egypt (where the Naqada I black-topped red earthenware originated) the traditional titular deity was the archetypal antigod Seth. Ironically, Egyptian art yields no firm evidence of Seth's usual animal form though, as I remark elsewhere in this book, references to his ophidian attributes are explicit in the literature of the dynastic periods. During later dynastic times in particular, the serpent figures very prominently in creation myths as Sito "Son of Earth" or Iru-to "Creator of Earth," as a monster that "took form, arising out of the darkness of Primeval Waters." Sito (fig. 43) is the manifestation of High God and, according to the Pyramid Texts, "the outflow of the Primeval Flood, the 'Provider of Attributes' serpent with many coils." In the Coffin Texts, God's "utterance comes from the serpent's mouth." The *Book of the Dead* prophesies that at the end of Time, the world will revert to the primary state of Chaos and Atum will become a serpent once more. This belief was probably a very common one, for the kings of the First Intermediate Period (2280–2060 B.C.) boasted that they were as preeminent as "that great surviving serpent, when all mankind has reverted to the slime."[79]

Beliefs like these, it would seem, were prompted partly by ecology, including the repercussions of the annual Nile floods upon the reptilian and human populations of a semiarid land, and partly by the socioreligious demands to which an early, semiurbanized, civilized agrarian people were subject. The Egyptians produced a vast repertoire of serpent myths. However, these are only variations on the solar, pluvial, and fluvial themes universal in the equally rich and impressive ophidian sentiments found in the religions, art, literature, and oral traditions of the inheritors of all the ancient civilizations, and of primitive

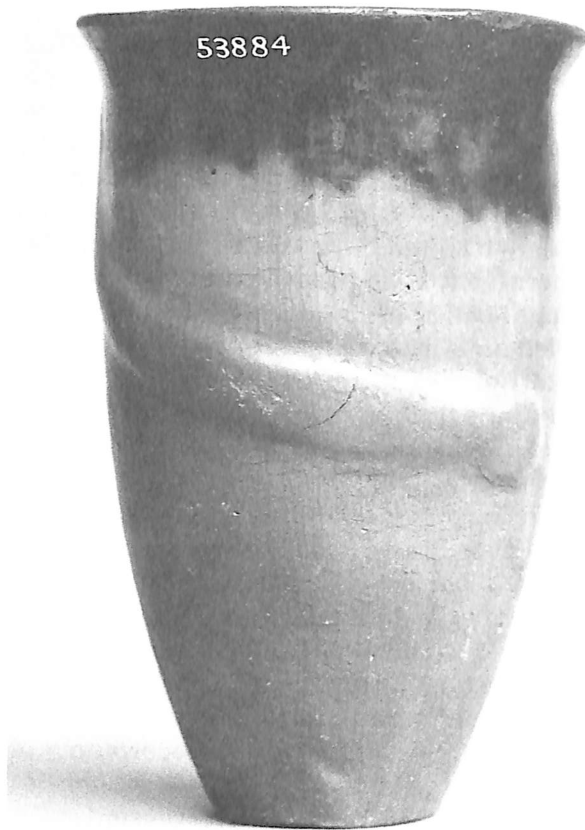


Fig. 107. Black-topped, burnished red pot, Naqada I (Amratian), ca. 3500 B.C. Egypt, decorated in relief (rare in pottery of this type) with a clearly ophidian motif.

cultures as well. That the ambivalent reverence evident in these traditions persists so markedly in highly modern urban societies is testimony to the complex interplay of the unique biological and social factors affecting a human sensitivity primeval enough to qualify the serpent for an extraordinary place among animals: as perhaps the earliest to have impelled a cult.

Echoing an awe found as well in other cultures, the Egyptians attributed to the Divine Creator the pronouncement that, once upon a time, nothing was yet in existence, "not even serpents, nor worms. While still immersed in the Primordial Ocean, I created from some of them [other] inert creatures."[80]

Notes and References

Chapter 1

1. Gillespie 1938, pp. 10-11.
2. Fowler, H. W. 1937. *A Dictionary of Modern English Usage*, p. 544. London: Oxford University Press.
3. Cuneiform texts on clay tablets that mention the various kinds of *muš* have been translated by Heimpel 1968, pp. 464–504. The identification of a definite type of dragon with *muš-huš*, according to him (p. 483), is based on a description of the city gates of Babylon, where a *muš-huš* is named and portrayed in enameled tile on the Ishtar Gate. This dragon has the body of a large, swift-running mammal with a long thin neck ending as the head of a horned viper, the front feet being those of a large felid and the hind feet those of a bird of prey. The whole body with the exception of the legs and snout is covered with scales (for more details see fig. 36). A winged, clearly ophidian version of this creature is engraved on an alabaster vessel of King Gudea illustrated by Parrot 1961, fig. 289.

4. Throughout this book, the word 'cult' is used in a narrow sense implying the numinous, i.e., as an element in a system of religious worship, rites, and beliefs, or an object or idea commanding great devotion or concern; not in a sense implying the unusual, unorthodox, or spurious.
5. Haupt 1963, and Aymar 1956 are useful compendia of literary references. Regarding the fabulous serpents of medieval French art, see Debidour 1961, pp. 218–24 and 219–316. Naidu's "The Festival of Serpents" appears on pp. 110–11 of her collected poems (1943); and Lawrence's "Snake" in a compilation of his poems annotated by V. Sola Price and W. Roberts, vol. 1, pp. 349–56, London: Heinemann.
6. Söderblom 1933, p. 17. Also see Ehnmark, 1956, pp. 9, 10. The "natural equipment" of the Isleta Pueblo of the southwestern U. S. A. is the *ikaina* rattlesnake, whose scales are carried as a bundle in the chief's pouch along with a powder that he rubs on his eyes (in order to assimilate the *ikaina's* 'clairvoyance') in rites that involve his acting like this serpent—"turning, and twisting and hissing" (Parsons 1939, p. 927). Hivale (1946) describes similar behavior by Pardhan and Gond priests during rites aimed at neutralizing the effects of cobra bites.
7. Cook 1964–65, vol. 1, pp. 441–53.
8. Durkheim 1915; Lévy-Bruhl 1923, 1926; Malinowski 1935; Lévi-Strauss 1963a; Evans-Pritchard 1965; Lienhardt 1961; Willis 1974; and Sperber 1975a, among others.
9. Cited by Durkheim 1915, n. 2, p. 170. For more on Wundt's views, see van Baal 1971, pp. 96–97, and Evans-Pritchard 1965, pp. 37–38.
10. Elkin 1964, pp. 162–63 and n. 7. Also see Elkin 1933, and Mountford 1978, p. 94.
11. Lévi-Strauss 1963a, p. 5.
12. Alekseenko 1968, pp. 175–91.
13. Evans-Pritchard 1956, pp. 18, 19, 36, 37, 46–48.
14. Mandlik 1896, pp. 235–67.
15. This is S. N. Kramer's (1944, p. 107) translation of the Sumerian text on Enmerkar and the Lord of Aratta. The idyllic situation it describes is, however, eventually negated by the god Enki for reasons unknown.
16. Leshner 1978, pp. 249–77; Gray 1971, pp. 53–67.
17. Douglas 1966, p. 72. This sentence is critically discussed, in its proper context, by Skorupski 1976, pp. 56–57.
18. La Barre 1969, pp. 92, 102–6.
19. Mundkur 1978, p. 541; 1980a, pp. 59–60.
20. Eysenck 1978, pp. 39, 40.
21. Sperber 1975b, p. x. See also Alleau 1977, for another viewpoint.
22. The availability of G. P. Murdock's *Ethnographic Atlas* and of the Human Relations Area Files would, together, seem to mitigate this difficulty in that these sources reduce human societies to 563 representative clusters of more or less distinct cultures (thereby simplifying any systematic worldwide survey of cross-cultural interest) and provide key references to these sample societies. Unfortunately, these references mostly stress cultural anthropological aspects irrelevant to or inadequate for our purposes. The information I have brought together is largely from various other, independently selected sources. I have striven, however, to include as many "nuclear" cultures or their subcultures as seem sufficient to contribute to generalizations.
23. Pavúk 1964, fig. 7 and p. 14. Also see his figs. 1–6.
24. Wagner and Wagner 1934.
25. Jéquier 1905, figs. 56, 58. Regarding the serpent in Elamite religion, see Hinz 1972, pp. 35, 41, 62, fig. 27 and pl. 22, 26. The serpent motif in ancient Persian art, both in Elam and elsewhere, is profusely illustrated by Toscanne 1911 and Amiet 1966, 1973. Also see Lamberg-Karlovsky and Tosi 1973, for the prehistory of the area and examples of ophidian motifs in excavated relics.

26. Karageorghis 1971, pp. 32, 33; Gjerstad 1963, p. 3; Dikaios 1940, esp. pp. 165–72 and the many illustrations with zigzags as well as obvious ophidian motifs. Also see George Thompson 1961, pp. 113–14, and Müller 1928, pl. 34 and 35. Nilsson 1950, Harrison 1922, Cook 1964–65, and Willets 1962 discuss Aegean serpent and bull cults in great detail.
27. Zervos 1956, 1957, 1961/62, 1963, illustrates these amply. Clay images of bucrania with serpent scales painted on them occur over a hundred miles inland north of the Black Sea and are illustrated by Boardman 1963, figs. 17, 18; also see p. 41.
28. Ghirshman 1938, p. 49 and pl. 63 (s. 1807), 64 (S. 121), and 69 (S. 1695); Péquart, Péquart, Le Rouzic 1927, pp. 17–20, esp. pl. 5–8, 20, 71, 74, 101, 106, 110 and 125. The latter stress that the few animals that figure on the menhirs of Megalithic Brittany belong to only three identifiable groups: "(1) the reptile, certainly 'serpent' (2) the quadruped, probably 'oxen' (3) the cephalopod, very likely 'stylized cuttlefish.' " Consistent with their chthonic associations, the five undulating serpents (each about 90 centimeters long) on the menhir at Manio are carved on the subterranean section.
29. See Savory 1973 on explicitly ophidian ornamentation as a link between Northwest European and Iberian Megalithic art. Representative Irish monoliths are discussed by O'Kelley 1973; the Iberian by de Albuquerque e Castro 1966, Bethencourt Ferreira 1940, Bouza-Brey Trillo 1953, and Jalhay 1929. Leisner and Leisner 1943, vol. 1, p. 493, tend to regard certain other zigzags on Iberian pottery as symbols of water. For more recent documentation, see Almagro Gorbea 1973, esp. fig. 22 *(2), (3), (4),* and fig. 34 *(9), (14), (15),* and *(16)*. Also see Malhomme 1959–61 and Jodin 1964 for some remarkable petroglyphs of the Grand Atlas, Morocco, which include clear astral/serpent motifs.
30. Abramova 1967, pp. 79–80, very briefly mentions the Mal'ta specimen and others from Europe and Siberia. Abramova's dismissal of Gerasimov's views and overcautiousness in recognizing the more stylized motifs must be judged vis-à-vis the information I present elsewhere in this book.
31. Boroneant 1972, pp. 111–13 and fig. 4. The antler is unrelated to the excavated cave (Gaura Chindiei, Pescari, Severin) mentioned below. I am indebted to Dr. Boroneant for unpublished information and a photograph of the painting on the cave wall given me during my visit to Rumania in 1974.
32. Srejović 1972, pp. 23, 105, 120–21.
33. Srejović 1966, pl. 6, fig. 9. Srejović 1972, p. 104, also mentions another "bone needle . . . whose upper part, merging into the sinuous body of a snake, quite unexpectedly ended in the realistically carved head of another animal, most probably a dog."
34. Willvonseder 1937, figs. 2, 3 and pp. 279–83. Details regarding the religions and ethnic groups of Bronze Age Central Europe are obscure and controversial. In Switzerland, for instance, there are no indications of buildings set aside for the rituals of a settlement, and the material aspects of culture are known chiefly from "scattered, disorderly burials" that suggest complex and indistinct rites. According to Sauter 1976, pp. 109–11, the religious beliefs can be "deduced, though not clearly, from personal ornaments and symbolic decorative motifs. The sun is represented (wheels, disc, etc.) with its animal attributes (horse, swan, or duck)." This is well exemplified by the petroglyphs at Carschenna (fig. 6c), in which a diminutive quadruped (horse?) is visible underneath the solar discs. Sauter (p. 111) refers to the accompanying large zigzags merely as "long wavy lines"—a reasonable description, since explicit indications of ophiolatry are not known, though many incised patterns on pottery are suggestive(?) of ophidian body form or skin designs. Also see Zindel 1970.
35. Glob 1974, pp. 116, 153–67, and figs. 45, 64, 65, 69, and 71.
36. May 1935, p. 1.

37. Kalicz 1970, pp. 17, 33, 78.
38. The pubic triangle is explicitly indicated in other Hungarian clay idols of the same period, for example, the so-called Venus of Kökénydomb and the Altar of Kökénydomb. In an idol with a flat, triangular head, the pubes, indicated by an incision, are abnormally located between the breasts. Other idols represent women as highly steatopygous (cf. Kalicz 1970, figs. 1–4, 12, 36–39).
39. Häusler 1963, pp. 894–97. Also see Leščenko 1930, figs. 7–11; Markovin 1962; Maringer 1977.
40. Formozov 1965, fig. 63 (2) and pp. 128–29.
41. Kheopin 1964, figs. 45 and 48 and p. 106.
42. Masson and Sarianidi 1972, chap. 6 and fig. 26.
43. Bellairs 1970, vol. 1, p. 126. *Tupinambis, Heloderma,* and a few snakelike, limbless lizards have rather long cleft tongues, but these (mostly New World forms) are very rarely encountered.
44. Prendi 1966, pp. 3–5, 8, 10 and pl. 8 (7). In Neolithic Albania, an ophidian cult may have been more prevalent than is indicated by the excavations known to me. Coeval East Danubian and Greek (Thessalian) pottery certainly have affinities with the Albanian and yield stronger evidences of ophidian motifs. Presumably the cult was widespread over the entire region. The trade in Albanian obsidian is one indicator of early cultural and trade relations in that region.
45. Neith ("the Oldest One," "Mother of the Gods") is generally anthropomorphic and bears a pair of crossed arrows, occasionally a single bow, as her symbols. Her ophidian aspect, if any, is obscure, though her progeny is a reptile (the crocodile deity Sobek). As creator-goddess she is linked with the primordial waters and, by implication, with their inhabitant, the "serpent with many coils . . . the manifestation of High God." See Schlichting 1980, pp. 392–94; Bonnet 1952, pp. 512–17; Keimer 1947, pp. 1–12, esp. n. 2, p. 12.
46. Musée de l'Homme, Paris, Acc. No. 43.27.603 ("Animal du monde souterrain, auxiliare du monde chamanique. Yakoute ou Toungouse").
47. Labat 1952, pp. 170–71, item 374; Heimpel 1968, pp. 486–504; Chang 1970, pp. 35, n. 6, 207, 285, 296.
48. Chaplin 1974, 36–39, figs. 14, 15. Also see Hambly 1931 for a general discussion of the python cult.
49. Kenny 1976, pp. 152–56.
50. Tavera-Acosta 1956, esp. figs. 1, 2, 5, 6, 9, 10, 50, 51, 63, 68–71.
51. The ventral scales are not always seen in the Chinese dragon. For good examples of these, see Kuei 1976, figs. 9 and 10. Regarding the basilisk, see Debidour 1961, figs. 313–16 and pp. 220–21. Ventral scales are clear in the *muš-huš* on King Sargon's alabaster cup (see n. 3 above). The Colombian monolith is described by Bennett 1946, pl. 173.
52. Díaz Bolio 1964, esp. pp. 348–51, indicates the wide range of motifs inspired by the rattlesnake in Mesoamerican art. However, he mistakenly implicates *C. durissus* (p. 351) in place of *C. triseriatus anahuacus*. The differences in squamation, normal limits of variability, and taxonomy of Mexican rattlesnakes are discussed at length by Klauber 1972, pp. 27–138, 200–202; Gloyd 1940, tables 3 and 8 and pp. 91–95 esp. regarding *C. triseriatus anahuacus;* and Smith and Taylor 1945, n. 8, p. 196. For numerological details of the Mesoamerican religious calendar, its origins and symbols, see Caso 1967; Beyer 1965, pp. 134–256. The *olin nahui* symbol, in one of its simplest manifestations, is represented merely by two U-shaped intertwined serpents etched on a pot of the Nicoya region of Costa Rica (Acc. No. 74, Collećion de Molinas de Costa Ricas, S.A., Exhibition of Costa Rican Art, Museo Nacional de Antropología, Mexico City, January 1976). Many cultures outside Mesoamerica have also given much attention to details of morphology when portraying the serpent in

their religious art. In some Greek works, the head is sculptured with such remarkable accuracy that zoologists have identified it as that of the venomous species *Coelopeltis lacertina* (see Harrison 1922, p. 327).

53. Herrera 1935, p. 228; Palacios 1935, pp. 233–63; Marquina 1964, pp. 164–77. A massive, highly stylized stone sculpture of the head of Xiuhcoatl has exactly fifty-two ornamental motifs (half of them circular, and the other half, rectangular) carved in two parallel series on the upraised, upper lip (See Flores Guerrero 1962, pl. 64). Ophidian symbols on the astronomical buildings at Chichén Itzá are discussed by Arochi 1981, chap. 5.
54. von Winning 1968, fig. 308.
55. Faris 1972, pp. 49–50, 92, and table 8.
56. Kroeber 1908, fig. 4; Du Bois 1908, pp. 93–99; Waterman 1908, pp. 303–4.
57. Marshack 1972, p. 169, 183, 211, 223, and 230 and figs. 60, 100, 109; Nougier and Robert 1958, figs. 16–18 and pp. 27, 28, 51, and 209.
58. For an extensive treatment of the art of the period, see Leroi-Gourhan 1968. For the Spanish material, see Acosta 1968, figs. 8–13, map 10, pp. 63, 74, and 75; Acosta also mentions the abundance of triangular motifs, though these are not related to the serpentiform paintings.
59. The Hopewellian culture flourished between at least 500 B.C. and A.D. 400 from western New York to Kansas and Iowa and northern Wisconsin to Mississippi, with foci chiefly in Illinois and Ohio. For details and lists of grave goods, see *Scientific Papers, Illinois State Museum, Springfield,* vol. 12 (1964), p. 22; vol. 7, pt. 2 (1961), tables 2 and 3; and vol. 5 (1952), pp. 244–48.
60. Vinnicombe 1976, pp. 111–13, 151–54, fig. 81, pp. 229–37. An analysis of the complex motivation for these paintings is attempted by Pager 1976.
61. Vinnicombe 1976, pp. 229–30. Incidentally, this method of at least temporarily quelling a captive serpent is well known to professional snake charmers and adherents of serpent-handling cults. The animal's natural tendency is almost invariably to escape, to struggle forward rather than turn its head backward to bite the restraining hand. This peculiarity is particularly noticeable in the cobras, which are widespread in Africa and Asia (Wall 1913, p. 259).
62. Vinnicombe 1976, p. 233.
63. The contradiction in terms is obvious. Thought involves deliberate, discriminative processing of sensory information received by the brain. There is always a considerable delay before one can perceive the effects, which, as a rule, are highly unpredictable from individual to individual and, more so, from culture to culture. By contrast, instinctive patterns of behavior, such as responses to stimuli causing pain or fear, are subservient to the autonomic nervous system. The so-called emergency ("fight or flight") reaction is an unpremeditated, spontaneous but predictable, almost instantaneous series of physiological effects governed by the sympathetic branch of this nervous system acting in conjunction with hormones secreted by the adrenal medulla. It is important to realize that the higher animals respond to such aversive stimuli the very first time they are exposed to them and, furthermore, retain strong memories of the experiences. Subsequent exposures, however, may produce modified reactions depending on a variety of factors, including "learning" and "experience." For details, see chap. 5.

Chapter 2

1. Thompson 1970, pp. 214–22 and figs. 4b, 5b, d, e, f.
2. Darlington 1957, pp. 178–80, 185; Swaroop and Grab 1954; Minton and Minton 1975; Reid 1975; Steward 1971; Heatwole 1975.

3. Reid 1975, pp. 420, 423.
4. Swaroop and Grab, 1954.
5. Bhattasali 1929, pp. 212–27; Mandlik 1896, pp. 235–67; Dimock 1961–62; Dimock and Ramanujan 1963–64; Vogel 1926.
6. Spiro 1967, pp. 3–4, 49.
7. Leffkowitz 1962, pp. 5–8.
8. A belief common in Japan is that the natricine species known as *yamakagashi, Rhabdophis tigrinus* (Boie), is innocuous. On the contrary, it is dangerously venomous and potentially lethal to man, since the overt effects of a bite are not immediately apparent and neurological symptoms are obvious only on the third or fourth day (see Mittleman and Goris 1974, pp. 115, 118). These factors surely affect the reliability of vital statistics.
9. Fleming 1976, p. 158.
10. Kidder 1968a, p. 94 and pl. 105, 124, 125, 127–29, 133, 156, 172, 201; Kidder 1968b, pp. 28–31, pl. 1c, 4a, b, c.
11. Fairchild 1967, p. 754.
12. Tallquist and Osterlund, 1962, pp. 1073–77.
13. Vorren and Manker 1962, pp. 94–95; Ränk 1956; Moora 1957, pp. 230–31; Liden 1938, fig. 9; Gelling and Davidson 1969; Hallström 1960; Gurina 1956; Althin 1950.
14. O'Kelley 1973; Ross 1967, pp. 135, 137, 345–51 and 44a and b, 68a and b; Lengyel 1969, pp. 39–41; Dillon and Chadwick 1967.
15. Simpson 1979, pp. 79, 84.
16. The prayer is a translation of Barb's (1953, pp. 9–10) German rendition of the original in Latin.
17. Roughly estimated on the basis of a 1960 rural population of about 32 million or considerably less. The 1960 census estimated a total population of 39,642,671, of which at least 7,323,900 dwelt in provincial capitals.
18. Personal communication from Dr. Pnina Zadka, Director, Health Section, Government of Israel Central Bureau of Statistics; based on data for 1975–79.
19. Henriques and Henriques 1971 is the single most exhaustive source of information on toxicology and envenomation effects. Also see Klauber 1972, pp. 742–44; McCreary and Wurzel 1959, p. 268; Parrish and Pollard 1959, pp. 277–86.
20. Minton and Minton 1969, pp. 120–22, cite several instances of tribes that use venoms for poisoning their arrows. If a speculation be permitted, this tactic may be one of primitive man's earliest "improvements" on his bow and arrow technology, as exemplified by the Bushmen of the Drakensberg region of South Africa, and as important as the use of plant poisons. See *Ciba Symposium* vol. 3, no. 7, pp. 994–1022, on arrow poisons.
21. Gharpurey 1962, pp. 54–57, 92–93; Corkill 1939, p. 46.
22. Heatwole 1975; Cowles and Bogert 1944, esp. pp. 293–95; Benedict 1932, pp. 62, 148, 190, 435.
23. Wall 1970b, pp. 725, 730–31; 1911 pp. 936–38.
24. Boulenger 1897, p. 74.
25. Pitman 1913, p. 636.
26. Wall 1913, pp. 250–52, 551–52.
27. Fraser 1893, p. 307.
28. Gillespie 1938; Logan Home 1928, p. 610; Warren 1937, p. 150.
29. FitzSimons 1970, pp. 166–67; Rose 1962, pp. 377–86; Bellairs 1970, p. 189; Bogert 1943, p. 341.
30. Klauber 1972, pp. 466–68; Rose 1962, p. 402.
31. Minton and Minton 1973, pp. 220–25; also see Caras 1975, p. 136.
32. *The Hindustan Times Weekly*, Sunday, July 3, 1977.
33. Eberhard 1968, passim, esp. pp. 378–99.

34. Greppin 1976, pp. 233, 240.
35. Boswell 1972, pp. 2, 3, 10, 19, 22, 42–50. The reader must be warned against relying on this author's assertions concerning connections between Ethiopians, Celts, and Phoenicians, implicating questionable linguistic and cultural "parallels."
36. McIlwraith 1948, vol. 1, pp. 74, 75, 525, 534, 595; Boas 1896; 1935, pp. 146–48; Locher 1932; Drucker 1951, pp. 153–54.
37. Turi 1931, p. 147.
38. Riesenfeld 1950, pp. 132–56, 294, 665; Arndt 1951, p. 207; Poignant 1967; Brown 1910, pp. 84–238.
39. Goldman 1963, pp. 92–94, 167, 181, 257.
40. Reichel-Dolmatoff 1971, pp. 25, 26, 32, 33; Karsten 1926, pp. 236, 288, 290, 291; 1935, p. 220.
41. Haberland 1959, pp. 301, 308; 1963, pp. 153, 393, 471 ff., 516, 715.
42. Schapera 1971, pp. 34–42.
43. Hauenstein 1960, pp. 217–34.
44. Hutton 1968, p. 28.
45. Elwin 1939, p. 366.
46. Elkin 1930, pp. 349–52; Loewenstein 1961, pp. 31–40; Radcliffe-Brown 1926, pp. 19–26; Piddington 1930, pp. 352–54; Robinson 1966, pp. 47–82.
47. Du Bois 1908, p. 179; Sparkman 1908, pp. 222, 223; Waterman 1908, pp. 297, 303–4. See figure 27 for *girls'* puberty-rite paintings.
48. Fewkes 1897, pp. 288, 304; Voth 1903, p. 292.
49. Eggan 1966, p. 255.
50. Wheelwright 1956, p. 78.
51. Mooney 1900, pp. 252–53; Mooney and Olbrechts 1932, pp. 176–77, 184–85.
52. Bruce 1975, pp. 30, 31, 44.
53. Roheim 1972, pp. 127–42; Elkin 1930, 1933; Berndt and Berndt 1964; Robinson 1966; Montagu 1974; Tindale 1959.
54. Munro 1963, pp. 19, 108. Kinashut kamui is closely lined with Nusa-Koro kamui, an invisible female spirit around whom also there are traces of a serpent cult involving ancestor worship. Unlike the "heathen" Ainu, Christian Ainu regard the serpent as a source only of evil. Regarding *hoyau* and Palaeoasiatic shamanistic elements in the epics of the Hokkaido Ainu, see Phillippi 1979, pp. 3, 154. Amaterasu's ophidian aspect is discussed by Fairchild 1967, p. 754.
55. Sternberg 1929, pp. 769–82.
56. Yoshida 1977, pp. 101–2. Also see Pretzell 1970 regarding early traditions.
57. Bradūnas 1975, pp. 7–15, 20–24.
58. The Enets, a group of eastern Siberian Samoyeds, give the harmless seal no circumlocutory names but do use such names for bears and wolves,"especially during an encounter" or when hunting them (Prokofyeva 1963, pp. 16, 156). The Luo of western Kenya, who venerate but greatly fear the hyena, avoid *ondiek,* the literal word for it and use the circumlocutory *apul-apul*—a term that is also applied to the serpent (*tond-bungu,* "rope of the forest") but apparently to no other creatures featured in folktales (Hauge 1974, pp. 43, 90–93).
59. From various sources, including the *Amarakoṣa,* and Apte 1890.
60. The Atharva Veda is dated to about 800 B.C., if not earlier. Its contents, however, reflect the traditions of the Dravidian and aboriginal societies subjugated by the Aryan immigrants. For connections of serpent hymns with earlier explicit writings, see Bloomfield 1897, Introduction. The *avidyā* metaphor occurs in *Vedāntasāra* 31, and Saṅkara, *Ātmapancaka* 2. The Atharva Veda stanzas quoted are 5, 13.4, 6.56.1, 10.4.8, 10.4.1, 10.4.18, 4.3.2, 10.4.23, and 12.1.46.
61. Apte 1890, pp. 9, 18, 340. *Garuḍa Purāṇa,* chaps. 19, 20; *Kāmaratna Tantra.*
62. Wilson 1955, p. 326; also p. 12, n. 1, 6, 7, 10.

63. Borghouts 1973, pp. 140 ff.
64. Ranke 1920; Pieper 1931, p. 18 and n. 1.
65. Breasted 1912, pp. 95, 135.
66. Griffiths 1960, pp. 37, 39.
67. Shorter 1935, pp. 43–45, cites several other inscriptions like this one.
68. Kees 1941, p. 54.
69. Kees 1941, p. 55.
70. *Am-Duat* texts and tomb paintings may be found in Piankoff 1956, pp. 490–93 and figs. 4, 5. Shorter 1935, pp. 45–48, cites several texts on the enmity between cats and serpents. Mafdet dwelt in the "Hall of Life," keeping it clear of intruding serpents. Hornblower (1943, p. 86) mentions an "authentic case" of a cat that killed horned vipers in Upper Egypt "simply by pouncing on them with her claws and then biting them to death." The Jews, who have strong historical ties to Egypt, regard cats as dangerous adversaries of the serpent and immune from its poison (cf. *Jewish Encyclopaedia* 1935, vol 11, p. 203.) The *Journal of the Bombay Natural History Society* 38 (1935), pp. 387–88, gives pertinent information from India.
71. The literature on Egyptian cippi from various museums, including hieroglyphs, is comprehensively reviewed by Seele 1947.
72. Saggs 1962, p. 322.
73. Landsberger 1950, p. 366.
74. Speiser 1955, pp. 64, 65, and Kramer 1961, pp. 76–81: That Tiamat and others were conceived as serpents is also clear from the decor of the 'Ain-Samiya goblet, regarded as the "earliest evidence for a protoversion of the Creation Epic." Here Tiamat is depicted in the form of an undulating serpent, but in a later clay plaque from Khafaje she is depicted as anthropomorphic. For details, see Grafman 1972; Yadin 1971, p. 84; Yeivin 1971, fig. 2.
75. Heimpel 1968, Nos 81.9, 85.5, 85.6, 87.3, 97, 97.2, 97.3 and several others.
76. Regarding the "distinctly ophidian" nature of Niraḥ (literally "viper"), see D. O. Edzard in Haussig 1965, p. 120. Extracts from the temple hymns are from Heimpel 1968, Nos. 87.3, 87.4, 87.6, 87.7, and 97.4. See Nos. 85, 85.1, 85.3, 85.7, and 85.9 regarding *muš-huš;* 84 and 84.1 to 84.4 regarding *muš-mah;* and 87 and 87.1 to 87.7 regarding *muš-šà.tùr.*
77. Heimpel 1968, No. 85.8. Dumuzi, as an agricultural god, was also likened to bull and goat. He had no scorpion alter ego, but he bore the epithet Ama-ušumgal-anna, which, according to Ringgren 1973, p. 11, "perhaps means 'the mother is the dragon of heaven.' " Jacobsen 1976, p. 26, implicates the date palm. However, the ophidian nature of the dragon *(ušumgal)* is explicit in the compound *muš-ušumgal.* It is of interest that Dumuzi's betrothal to Inanna was mediated by the sun god.
78. Heimpel 1968, p. 42.
79. Astour 1968, esp. pp. 26, 27.
80. Jeremiah 8:17. There is a similar sentiment of doom in the Old Babylonian incantation "viper, the serpent that cannot be conjured" (cf. Astour 1968, p. 17).
81. Astour 1968, pp. 26, 27. Structuralists who interpret the "meanings" of symbols will perhaps agree that myths seen in their correct perspective often, as in this instance, tend to invalidate trite generalizations about the phallic symbolism of the serpent.
82. Patai 1964, pp. 57–61. Regarding the attributes of Samael, see Blau's "Samael" in *Jewish Encyclopaedia* 1905, vol. 10, pp. 665–66.
83. *Avot* 5:5.
84. Genesis 3:15.
85. Feliks 1971, p. 14.
86. Yahweh and Asherah are discussed by Kaufmann 1969, pp. 62–69, 292, n. 2, and Patai 1965, pp. 48–49, respectively. Reflecting the Talmud (Baba Batra 74b), where he figures as *Sar shel Yam,* the demoniacal ruler of the sea, Rahab is represented in

Job 9:13 and 26:12 as the equivalent of the Mesopotamian serpent of Chaos, Tiamat. The name Leviathan is derived from a root denoting "coil," or "twist." See Lauterbach and Kohler in *The Jewish Encyclopaedia*, 1905, vol. 10 (p. 308) and vol. 8 (pp. 37–39), on Rahab and Leviathan, respectively.

87. These quotations (translated from Hadith by al-Bukhari and Ibn Hanbal) are viewed in their wider contexts by Mundkur 1980 *b*. Also see Wensinck 1916, p. 63.
88. Cook 1964–65, vol. 1, pp. 540, 725–26; and vol. 2 (pt. 2), pp. 1152, 1153, n. 1.
89. Harrison 1922, pp. 17–23.
90. Harrison 1922, pp. 223, 232, 233–237; Fontenrose 1959, chaps. 3–6.
91. Cook 1964–65, vol. 1 pp. 211–51.
92. Eberhard 1968, pp. 380–81; Werner 1961, pp. 416, 448–49.
93. Fernández 1959.
94. Ruiz de Alarcón 1892, pp. 54, 55, 77–84. For specific invocations of the ophidian deities Chicomecoatl, Coatlicue, Tlaloc, Mixcoatl, Xiuhcoatl, Quetzalcoatl, and Huitzilopochtli, see Hvidtfeldt 1958.
95. Durán 1971, pp. 115–17 and n. 7.
96. Serna 1892, vol. 1, pp. 111, 112.
97. Steggerda 1942, p. 208.
98. Paredes 1963, pp. 59, 77–79.
99. de Avila 1968, (1598?) pp. 97, 99.
100. "En su oración cotidiana [los indios] no olvidan pedir a la divinidad, que ate sus perros [= culebras] para evitar su mordedura; es por esta razón que las culebras tienen virtudes medicinales insospechadas." (Oblitas Poblete 1971, p. 37.)
101. Klauber 1972, p. 975.
102. Biggs 1907, p. 1019.
103. Born of Typhon and Echidna, the Lernaean hydra was an enormous, nine-headed serpent with a breath so poisonous that whoever inhaled it fell dead. Every time Hercules cut off one of its heads, two would grow in its place. In Lithuanian *gyvate*, "serpent," is cognate with *gyvata*, "vitality," and with *gyvas*, "living," just as in Arabic *ḥayya*, "serpent," is cognate with *ḥayāt*, "life."
104. Traill 1895, p. 499.
105. Smith 1911, p. 863.
106. "Editor's Note," *Journal of the Bombay Natural History Society* 1931, p. 1083.
107. Klauber 1972, pp. 616–18.
108. The ophidian ancestry of the Chinese dragon is evident in later periods, not only from literature, but also in innumerable artistic representations that endow its belly with gastrostege scales of the kind that are uniquely the serpent's. Cf. Kuei 1976, especially figs. 9 and 10, and Munsterberg 1971. The Yang-shao pot is illustrated in fig. 30 of "Tresors d'art Chinois, etc., 1973.
109. Regarding Elamite cult practices involving naked priests dancing with serpents, see Hinz 1972, pp. 41–42, 61–62, and pl. 22. Also see Amiet 1966 and Toscanne 1911 for copious illustrations of Elamite artifacts with serpent motifs.
110. Preisendanz 1940, p. 198 (quoted from the *Book of Apopis*, dated to between 312 and the first century B.C.) The symbolism of ouroboros in the Near East is reviewed by Déonna 1952.
111. Merlo and Vidaud 1966, p. 302.
112. C. G. Jung in his foreword, p. xiv, to Neumann 1970.
113. Murphy 1929, p. 722.
114. Wall 1913, p. 388.
115. Barbour 1929, p. 52; *The Hartford Courant*, Oct. 19, 1979, p. E.34.
116. Ivanov 1954, pp. 251, 356, 367. Also see Eliade 1964, p. 152.
117. Lipskii 1970, pp. 167–68 and fig. 4.
118. Mikhailowski 1894, p. 64. The Yakut's memory of their first shaman goes back far

into their past. His name was An-Argyl-Oyun, and he revived the dead and gave sight to the blind (cf. Priklonskii 1953, p. 11). Curiously, the serpent is not mentioned in therapeutic contexts in Pripuzov's (*Human Relations Area File* 1953, pp. 22:1–22:3) list of animal drugs employed by Yakut shamans.

119. Vasilevič 1968, pp. 354, 355.
120. Cook 1964–65, vol.1., p. 81, and n. 1 (p. 84), Harrison 1922, p. 1; Howe 1955.
121. Isaiah 30:6.
122. Voliz, p. 137.
123. Bruyère 1930, pp. 105–9.
124. Klauber 1972, pp. 362–82.
125. Wall 1907*a*, pp. 209–10.
126. Ruiz de Alarcón 1892, p. 55 (para. 146).
127. de Morgan 1896, p. 164; Clark 1959, pp. 50–52.
128. Klauber 1972, pp. 418–19.
129. Al-Damīrī 1906 (1344–1405) p. 635; Smith 1975, p. 4 and fig. 3.
130. Keimer 1947, p. 6, n. 1.
131. Chang 1970, n. 1 (p. 189) and pp. 203–7.
132. Bell 1953, p. 93.
133. Karageorghis 1972, pp. 109–12; Zervos 1956, pp. 32, 49 and pl. 469–71, 603, 790, 791.
134. Aravamuthan 1939, pp. 190–92.
135. Kidder 1968a, p. 94 and pl. 104, 124, 125, 127, 129, 133, 156, 172, 201; and 1968b, pp. 28–31 and pl. Ic.
136. Dani 1970–71, pp. 65 and pl. 22b; de Cardi 1965, pl. 8 (1–7); Wheeler 1966.
137. Toscanne 1911, pp. 153–228; Ghirshman 1962, p. 60, fig. 10.
138. Marinescu-Bîlcu 1974, figs. 24–54; Niţu 1972, fig. 2 (5) and 13; Garašanin 1968, fig. 15.
139. Astour 1968, pp. 16–19, see esp. lines 5 and 6 in Strophe I.
140. Mandlik 1896.
141. Miller and Bedi 1970, pp. 392–409.
142. Wall 1913, pp. 250–59, 550.
143. This particular, perfectly normal animal was later purchased for the Edinburgh Zoological Park. That the cobras are not insensitized by drugs or harsh confinement is apparent from records of attacks and bites during some of the performances. It may be that, in general, strong sunlight, or direction and angle of the sun, and other inhibitions produced by captivity may mitigate the animal's aggressiveness. Gillespie 1938, pp. 113–15.
144. Astour 1968, p. 17.
145. Hinz 1972, pp. 35, 41–42, esp. 61–62, and 79 discusses ophiolatry in Elamite religion. Early stamp seals are analyzed by Amiet 1973, pp. 215–21 and figs. 16 and 18. On Elamite religious objects in general see Amiet 1966, on *labartu* Scheil 1929, p. 10, and on Murkum Porada 1965, p. 44.
146. Saint-Hilaire 1975, pp. 73, 109–10. In the eyes of nocturnal serpents, the intraocular filter that cuts down blue light is absent or weakly developed. Even in diurnal species its efficacy is poor in bright, direct sunlight, and this is why snake charmers seem to prefer to work in the sun or at least orient their animals carefully (cf. Bellairs 1970, p. 349).
147. Castañeda de Nacera 1896 (1540), p. 513.
148. Fewkes 1897, pp. 275–86; and 1900, pp. 971–73, 966, 986; Dorsey and Voth 1902, pp. 190–251; Voth 1903, pp. 286–91, 341–53; Warburg 1938–39, pp. 286–87; Waters 1963, p. 220.
149. Klauber 1972, pp. 411–504.
150. Pharmacologically inclined readers will find Hegnauer, R. 1964. *Chemotaxonomie der Pflanzen* vol. 3, pp. 590, 592–94, of considerable value in this regard.
151. A serpent's vertebrae are firmly but flexibly articulated and allow much latitude in

horizontal, but not vertical, movement relative to each other. No fewer than five joints between vertebrae prevent torsional injury; vertical and lengthwise stresses are less protected against. See Bellairs 1970; Hoffstetter and Gasc 1969; Goldby and Gamble 1957.

152. Voth 1903, pp. 291, 353. The preceding quotations are from the authors cited in n. 148.
153. Schwarz 1960, pp. 410–11 and fig. 2.
154. La Barre 1969, p. 21. These quotations are not intended to suggest that bites are unknown. These did occur despite the handling techniques, but rarely (see Schwarz 1960, p. 188). Recorded deaths are very few. Presumably, some form of medical treatment was sought after the attack of the symptoms of toxicity had impressed the congregation.
155. Svorad 1957, pp. 533–36.
156. La Barre 1969, pp. 7–8, 107–8.

Chapter 3

1. Goldman 1963, pp. 92–94; Kuntz 1963, p. 6.
2. Waley 1960, pp. 246–47.
3. Cooper 1975.
4. Caras 1975, p. 280.
5. Gloyne 1950, pp. 29–42.
6. Noguera 1977, pp. 127, 131.
7. Werner 1961, pp. 448–49. Also see Eberhard 1968.
8. Kees 1941, pp. 59–60 and n. 5.
9. Caras 1975, p. 288.
10. Hunn 1977.
11. Montoliu 1976–77, pp. 155–56, 166.
12. Thompson 1960, pp. 75–77.
13. The ophidian deities are Tlaloc, Quetzalcoatl, Coatlicue, Chicomecoatl (Xilonen), Ciuacoatl, Coatlantonan, Mixcoatl, Chaac, Tajín, and Cocijo. Several others, including Mictlantecuhtli, Tonatiuh, Xiuhtecuhtli, and Huitzilopochtli, have serpent motifs as their characteristic symbols. Ruiz de Alarcón (p. 176) and Serna (p. 310) mention many prayers to, and charms against, serpents, and even ants, but scorpions are relatively inconspicuous.
14. Antúñez 1972, pp. 2, 4.
15. al-Damīrī 1906 (1344–1405), p. 642.
16. Mundkur 1980b; Jamme 1947, pp. 73–77, 90.
17. The female Renenutet, Mertseger, Meshkent, Renpit, Naprit, Ourt Hekaou, Asbet, Naunet, and Wadjit; the male Atum, Nehebkau, Nebankh, Khamutef, Nebtaoui, Mehen, and Apep; cf. Bruyère 1930, p. 108.
18. Griffiths 1960, p. 136. The Buyeye of Tanzania use precisely this expression for the crocodile (cf. Cory 1946, p. 175).
19. Boston Museum of Fine Arts (Acc. No. 21.11699).
20. Broekhuis 1971, pp. 10–54; Bruyère 1930.
21. Heimpel 1968, pp. 464–513.
22. Zervos 1956, pp. 49–50.
23. du Mesnil de Buisson 1973, pp. 228–35 and n. 1, 2 (p. 235); Déonna 1959, p. 33.
24. Déonna 1959, p. 10; Buchanan 1971; Van Buren 1935.
25. Polarities of meaning in the symbolism of the serpent and birds, especially the eagle, are discussed by Wittkower 1938–39 and by Lurker 1963. Their views are of little relevance for our purposes but may be useful to those interested primarily in symbols and their "history."

26. Schärer 1963, pp. 11–26, 39–43, 163.
27. That the feathered serpent occurs at all in the art of the original Olmecs is denied by Bernal (1969, p. 83). Drucker, Heizer, and Squier (1959, pp. 197–99), who excavated Monument 19, tended to see in it a plumed rattlesnake, but this is not confirmed by the monument, now at the Museo Nacional de Antropología, Mexico (No. 13–599).
28. Davies 1977, pp. 58–64.
29. Palacios 1935, pp. 235, 263. On Chicomecoatl, See Durán 1971, chap. 4.
30. Hvidtfeldt 1958, p. 77.
31. Davidson 1936, pp. 88–89.
32. Elkin 1964, pp. 162–63 and n. 7; for details of the serpent in "assistant totemism" see Elkin 1933.
33. Gavazzi 1970, figs. 1 and 2. The Udehe inhabit the basin of the River Samarga, near Chabarovsk.
34. Boas 1935, p. 147. Also see Locher 1932.
35. The common features of this Indo-European myth are discussed by Greppin 1976, esp. p. 233. For details of "Cemetery H" and post–Indus Valley civilization relics, see Vats 1940, pp. 177, 249, 303, No. 255 (pl. 91), No. 12358 (pl. 77, 24), No. 8157 (pl. 118, 11), No. H2063 (pl. 62, 2), and No. H2456 (pl. 62, 4). Also see Wheeler 1966, pp. 53, 92. The "eagle"-like, imaginary bird (sometimes anthropomorphized) called *garuḍa* is merely a vehicle of the Indo-Aryan sun god Viṣṇu, but the god's alter ego is the cosmic serpent Ananta or Śesha. Both attributes are of quite late, post-Vedic origin. The Vedic Aryans occasionally conceived the sun as a bird known as *garutmat* (surely the prototype of *garuḍa*), specifying no distinct species (Macdonnell 1963, p. 152). It is of interest that serpent motifs are far more common than those of birds in the pottery of the pre-Indus cultures (earlier than 3000 B.C.) of Anjirā and Gumlā, Pakistan (see de Cardi 1965, esp. pl. 8, 1–7; and Dani 1970–71, pp. 64–69 and pl. 22a.)
36. Joshi 1971, p. 88; Bradūnas 1975; Gimbutas 1958, pp. 25–31.
37. Branigan 1969. Images of "the Snake-goddess and other snake symbols—the snake tubes of Gournia for example—are *clearly central* to the cult, though equally as common are small models of birds. . . ."
38. Nilsson 1950, p. 340. Also see Willets 1962, p. 73.
39. In addition, Zeus was worshipped in his serpent form under the names of Ktesios, Philios, and Sosipolis. He also, but less frequently, takes the form of a ram. "The old Minoan snake-goddess survives besides Zeus in the person of Hera" (Willets 1962, pp. 49, 52, 245–46).
40. Willets 1962, p. 74.
41. Gimbutas 1974, pp. 112–50.
42. Pollard 1977, p. 177 (quotation attributed to Sir William Halliday).
43. Harrison 1922, p. 331.
44. Griffiths 1960, pp. 132–34. Also see Posener 1970 under "Faucon," "Ibis," "Phénix," and "Nekhbet."
45. These include the horned antelope, dog, donkey, and an okapi-like creature known from a few Naqada I relics (ca. 3600 B.C.), but a clearly ophidian form, *identifiable as Seth's*, is not known (see te Velde 1967, pp. 7–26). However, Seth's ophidian qualities are transparent not only in metaphors of the dynastic period literature but also in the fact that, in Ptolemaic and Gnostic Egyptian cults, he was equated with the serpent god Typhon and the serpent-lion monster Jaldabaoth Sacla (see Cook 1964, p. 387; Brandon 1969, pp. 64, 339). Seth is believed to be represented, on occasion, by the hieroglyph Y
46. Ward 1978, p. 29 (see also his references to the views of Schott and Hornung). For myths containing metaphoric allusions to the ophidian nature of Seth, see Müller 1964, p. 107.

47. Budge 1912, vol. 2, p. 8.
48. Griffiths 1960, pp. 12–15, 34–40.
49. Reymond 1969, pp. 19, 34–35. Other animals supporting Horus are hawks, bulls, and lions, also in groups of fourteen each. The myth is described in detail in the "Building Texts," in Ptolemaic script, from the temple of Edfu. Abbreviated forms of it also appear in earlier periods and perhaps are an elaboration of the type of feud in which Seth is implicated.
50. Cook 1964–65, vol. 1, p. 206; Budge 1912, vol. 2, p. 8 (cited by Rowe 1928). It is noteworthy that Mut, the local vulture goddess of Karnak and the holy lake Ascheru, was eventually assimilated into the serpent goddess Edjo; and that, in myth, Mut is "the resplendent serpent who wound herself round her father Re and gave birth to him as Khonsu" (see Morenz 1973, p. 265; Frankfort 1948, p. 180).
51. Frankfort 1939, pp. 95–96; Kees 1941, p. 57.
52. Petrie 1924, p. 14.
53. For example, Broekhuis 1971; Bruyère 1930; Kees 1941, p. 57. Regarding serpents that were deified and their function as guardians of temples and palaces, see Wilson 1955, p. 442 and n. 28.
54. Morenz 1973, pp. 258, 264; Kees 1941, p. 55. The *sment* goose was "kept at Thebes as sacred to Amon, and is represented on tablets; but there is no trace of its being worshipped or being a tribal animal" (Petrie 1924, p. 15).
55. Kákosy 1963 p. 125 and n. 20. Vandier 1950 describes a wooden statue (Louvre No. E. 17.375) of Thoth in the form of an ibis trampling upon a serpent, the latter also shown pierced by four feathers. Thoth also had a baboon aspect.
56. There are fourteen sinuousities, thirteen painted on the base plus the model of the serpent—the same number as the markings within the ouroboros in figure 39*b*, perhaps to indicate, in either case, the number of phases during a lunar month of approximately twenty-eight days. Yang-shao pottery is illustrated extensively by Chang 1977, pp. 123–39; Ho 1975, chap. 4; Andersson 1943, esp. pl. 190, 191, 194 (2) and (4). Also see "Abstract 1963" and *Tresors d'art chinois* 1973, and Hentze 1965.
57. Chang 1970, pp. 115, 234. A *mythic* sea-bird, Yüan-chü, is mentioned in later times. Alleged to have camped for three days before the gates of the State of Lu, ca. seventh century B.C., it was viewed as a messenger of the gods and a sacrifice was made in its honor.
58. Smith 1968, p. 9
59. Chang 1970, pp. 189 and n. 1, 203–8.
60. Chêng 1960, vol. 2, p. 92.
61. Chang 1970, No. 37 (p. 287).
62. Chang 1970, No. 352 (p. 286) and n. 1 (p. 115).
63. For a concise account of Shang-Chou interrelationships, see Chang 1977, pp. 296–302, 366–86.
64. For other examples, see Shan-hsi Sheng 1963.
65. The union of yin and yang, of male and female, for instance, is represented in Han burial sculpture as a union of two half-human, half-serpent personages identified as sun and moon (see Chêng 1960, pl. 24, fig. 2[e] and p. 153; also pl. 74 [2]).
66. Illustrated minutely in *Hu-nan Sheng po wu*, vol. 3 (1973), pp. 1–8 (abstract in English). A similar silk banner occurs in an adjacent tomb (Tomb 3) dated to 168 B.C. On this, too, a woman whose lower body is that of a serpent is painted in the identical positions (also illustrated in *Chinese Sociology and Anthropology*, Winter 1977–78, p. 60).
67. Numerous examples of these objects are illustrated in *K'ao ku Hsueh pao* (1957) pp. 103–18.
68. Lyons 1978, pp. 11–16.
69. Waley 1955, pp. 18, 47, 52; see esp. Songs 3 and 8.

70. The Ch'u were an ethnically and culturally distinct people who emerge in history ca. 1100 B.C. as a political unit. The Honan oracle bones frequently contain the character *wu*, the Ch'u word meaning "shaman" (= "to dance"), but in uncertain contexts (cf. Waley 1955, p. 9). For a general account of the Ch'u, see Chang 1977, pp. 424–40. The prominence of the serpent (the zoological entity) in Ch'u religion is indicated by Major 1978, p. 237, and by Hayashi 1972. Cohen 1978, pp. 244–46 discusses images used in rainmaking ceremonies. Metamorphosis of the serpent into the dragon of art and myth was surely incipient in early Neolithic times (as the Yang-shao zoomorph in figure 39*a* clearly suggests), but no true dragon form occurs in art until the Shang period, i.e., before ca. 1500 B.C. Munsterberg's (1971, p. 7) view that the mythical dragon may have been inspired by an animal resembling the pterosaur—the latter known only from fossils—seems naive.
71. Werner 1961; Eberhard 1968.
72. Waterbury 1952, p. 139.
73. Mbiti 1970, chap. 9; Hastings 1955, vol. 1, p. 502.
74. Ramón Llige 1972. Also see Leigh 1966, regarding Glyph C. Bat gods are discussed by Paddock 1966 and illustrated in figs. 155, 177, and 186.
75. Vogt 1976, pp. 16, 17.
76. For details regarding Chamalkan, see Raynaud 1925, No. 30; see Thompson 1960, pp. 276–78 and fig. 43 (9–16) on variants of the bat-head glyph with "Ben-ich" affix and on *kan* and *yax* (pp. 45, 75) as symbols of the Chicchan (serpent) god in representations of water and serpents in Maya art in general. García Payón 1975, Thompson 1970, pp. 262–65, and Kelley 1976, p. 109 discuss the synonymy of Chicchan and Chaac.
77. Altar T at Copan bears a bat personage, and roof ornaments of Structure 20 have bat forms. Classic Veracruz (Huastec) iconography involving vampire bats is illustrated by Kampen 1978.
78. *Bats*, Day 11 of the Quiche Maya religious calendar, should not mislead anyone, for the word means "monkey." Day 5, Kan or Chicchan, named after the rattlesnake, portended serious misfortune (Goubaud 1937, pp. 14–17. Also see Caso 1971 and 1967. The civil calendar month *zotz* included no special ceremonies).
79. Kelemen 1969, pl. 212 and p. 257, misled by their stylized snouts and short bodies and feet, errs in calling them alligators. The latter, of course, lack a bifid tongue. On the other hand, double-headed serpents are commonplace in the art of Central America. Cocle gold ornaments from Panama include indubitable alligators with stylized tongues and tails, both patterned upon the serpent's forked tongue (his pl. 222c).
80. Elwin 1939, pp. 366, 376.
81. Hutton 1968, p. 256; Mills 1937, pp. 110, 238; and Hutton 1969.
82. Bahadur 1977, pp. 103–4.
83. Auboyer 1949, chap. 2.
84. Diószegi 1968, p. 387.
85. Okladnikov 1962, pp. 55, 58–60.
86. Hayashi 1972. Also see Major 1978. Waley 1955, pp. 9, 59, emphasizes that the Yellow River God (Ho-po) is the only one who, together with his powerful ophidian symbols, persists until modern times. The functions and practices of the Chinese *wu* (sorcerer, rainmaker, exorcist), he writes, "were so like those of Siberian and Tungusic shamans that it is convenient . . . to use shaman as a translation of *wu*," a word that occurs in the Honon oracle-bone inscriptions, though in sentences of uncertain meaning. Chang 1970, p. 115, indicates that in Shang times the territory of the Central Asian Huns was called "Dragon-land" by the Chinese.
87. White 1945, pl. 49. Paper 1978, discusses the symbolism of *t'ao-t'ieh* in detail.
88. Chang, 1970, p. 205.

89. Ssu-Yuug 1974, pl. 14, 20, 26, 28, 32, and the figure on p. 48.
90. Chang 1977, p. 127.
91. Eberhard 1968, pp. 170–71, 427.
92. Quoted in Hastings 1955, vol. 1., p. 521.
93. Mbiti 1970, p. 101.
94. Field 1937, p. 6, 11–14, 24–27, 35, 38, 40, 52, 62, 73–77, 81.
95. Trimingham 1952, p. 261.
96. Lienhardt 1961, chap. 3.
97. Kees 1941, p. 7. Morenz 1973, p. 258, mentions a minor Earth-deity, Aker, at first represented as a strip of land with a human head, the head later being replaced by a pair of lion heads. Aker, however, is overshadowed by Geb, who has no leonine symbolism.
98. Bruyère 1930, pp. 109, 117. A lesser ophidian deity, Ourt Hekaou, has the head of a ram. Mertseger appears in the guise of various goddesses but does not ordinarily assume their animal form, except partially the leonine. Bruyère (pp. 177–80) cites inscriptions on stelae which occasionally link Mertseger with Sekhmet ("elle emprunte parfois à Sekhmet sa forme de lionne") and also with Tefnut, who is sometimes leonine. Much of the information I have summarized is also treated elaborately by Kees 1941, pp. 7–11, and Posener 1970, pp. 151, 263–64. Note also that Renenutet, a deity whose predominant form is that of a hooded cobra, may be portrayed as serpent-bodied and leontocephalic (cf. Broekhuis 1971, pp. 10–54, regarding iconography; also de Wit 1951, p. 366, n. 2).
99. de Wit 1951, p. 312.
100. Žabkar 1975, p. 38.
101. Bruyère 1930, p. 225.
102. Žabkar 1975, pp. 36–37.
103. Jaldabaoth was identified with Seth. Regarding Chnoubis, Kneph, Jaldabaoth, and Khamutef (Kematef), see Delatte and Derchain 1964, pp. 54–57 and amulets Nos. 52 to 89; Clark 1959, pp. 35–37, 50–51; Brandon 1969, pp. 64, 344; Doresse 1960, pp. 174–75.
104. Nilsson 1950, pp. 387–88; Cook 1964–65, vol. 1., pp. 553, 592, 596–99; Willets 1962.
105. Brown 1960, pp. 91, 164–65.
106. Mellaart 1965, pp. 92, 98.
107. Mellaart 1967, p. 79.
108. Mellaart 1965, p. 87.
109. Mellaart 1967, p. 101.
110. Ringgren 1973, p. 66.
111. Goff 1963, p. 77, see esp. figs. 76, 78; an early pictographic character of the serpent has a short sinuous body, a cobra's hood, and bifid tongue (fig. 301).
112. Mallowan 1947, pl. 18 (a) and p. 122.
113. Homès-Fredericq 1970, pp. 47, 82, and esp. figs. 78, 100, 111, 115, 131, 162, 191, 195, 200, 208, 214, 215, 317, 363, and several others in which the serpent is indistinct. The lion occurs in figures 104 and 203.
114. The vase, illustrated by Hansen and Dales 1962, p. 79, is from an Early Dynastic II/III temple at Nippur.
115. Heimpel 1968, pp. 280–344, Nos. 36.2 (p. 284) and 36.40, n. 1 (p. 310).
116. Frankfort 1939, pl. 4d, f, h; plate 5h.
117. Frankfort 1939, p. 46. Plate 11h, illustrates a cylinder showing a man grappling with serpents. Also see Buchanan 1966, pp. 21–50 for similar themes, e.g., Seals 101, 108.
118. Frankfort 1939, pp. 67–71.
119. Frankfort 1939, pp. 177, 197–203, 215. Ishtar on a lion is seen in pl. 36, i.
120. Edzard, in Haussig 1965, under "Schlangengoetter, p. 120; Buchanan 1966, p. 61 and passim; Frankfort 1939, plate 21b, d, f, g, i; also passim.

121. A rough indication of the attention commanded by some animals lies in the number of pages Heimpel devotes to each: lion and leopard sixty-five; serpent forty-eight; scorpion two (not including some simultaneous references to it and the serpent); wolf four; raptorial birds (falcon, eagle, vulture, *ansu*-eagle) eighteen; dove (a divine symbol) eleven; domesticated bovines seventy-six; horse, mule, donkey nineteen.
122. Goff 1963, p. 117.
123. Goff 1963, pp. 75–76 and fig. 296.
124. Speiser 1955, p. 62 (lines 133, 134).
125. Ringgren 1973, pp. 69–75, 83–88.
126. Sachs 1955, pp. 331–34; Goff 1963, p. 178.
127. Gilgamesh's struggle with and eventual victory over both animals is celebrated in a sculpture in the Louvre (see *New Larousse Encyclopaedia of Mythology*, p. 67).
128. Amiet 1966, 1973; Hinz 1972, pp. 35, 41, 62, fig. 27 and pl. 22, 26.
129. The three are Saḥar, Naḥastāb, and Wadd. For details see Mundkur 1980*b*. Fahd (1968, pp. 184–85 and n. 3) traces Wadd to the Aramaean god of thunder, Hadad, who, in turn, was derived from the Mesopotamian thunder god Adad. Cylinder seals occasionally portray the latter mounted on a dragon or bull. Yaghuth has no leonine counterparts outside Arabia.
130. For the natural history of, and actual danger (or lack of it) normally posed by, jaguars, see Caras 1975, p. 25, and Perry 1970. The reader should be careful about accepting the latter's assertions on "supernatural jaguars" (chap. 8) at face value. His work contains such errors (p. 102) as labeling the patently ophidian Cocijo a "jaguar god."
131. Steward and Faron 1959, pp. 256–57.
132. Reichel-Dolmatoff 1975 (spirit animals especially mentioned on pp. 84, 99, and 191; the serpent and jaguar are constantly singled out passim). Also cf. Goldman 1963 and Karsten 1926.
133. Reichel-Dolmatoff 1975, figs. 36–57.
134. Lavallée 1970, pp. 102–23, 160, 171, 181–85.
135. Kauffmann Doig 1973, 297–303; Kutscher 1954, pl. 77c.
136. Kauffmann Doig 1973, pp. 346, 354–356.
137. Tello 1923, pp. 598–99.
138. Chávez 1975, p. 17, n. 23 and pl. 1–10; Chávez and Mohr Chávez 1975, pp. 58–59, pl. 23–28.
139. For descriptions of El Lanzón and the general archaeological relationships of the Chavín style of art, see Tello 1960; Rowe 1962; Lumbreras 1970; 1971; Kauffmann Doig 1973, pp. 217–19; Benson 1971.
140. Izumi and Sono 1963, pp. 153–57, pl. 41, 100c, d, 122; Patterson 1971, p. 40.
141. Izumi and Terada 1972, p. 140, fig. 182.
142. Izumi 1971 (in Benson, ed.), fig. 5; Izumi and Sono 1963, p. 157.
143. Lumbreras 1971, figs. 6, and esp. 7 b, 8 b and c (reptilian scale texture?), 9 a, á, and e. Also see Lumbreras 1970, pp. 137–59.
144. "Las representaciones de jaguar son contadas en el arte lítico de Chavín . . . representaciones individuales o preponderantemente félidas son escasísimas. . . . La serpiente está presente en muchos casos y, con frecuencia su boca con colmillos, algunas veces con un solo colmillo delantero, ha sido estimada superficialmente como boca de felino. Los mitos andinos (costa y sierra) giran especialmente alrededor de aves y de serpientes; y en segunda instancia sobre felinos como veremos en . . . la iconografía Chavín." Kauffmann Doig 1973, pp. 168–172. He also writes that the monkey, viscacha, frog, etc., are minor motifs at Chavín, eagles and falcons being the most frequently represented. Their purely decorative function is often obvious. There is no trace of avian characteristics in El Lanzón—"En lo demás no se descubren alusiones ornitomorfas . . ." In fact, he believes (p. 218, n. 19) that the

eyes of this idol are very suggestive of a serpent's. At least for this early period, his assertions squarely differ from the earlier views of Tello (1960) and others regarding the "dominance" of the feline motif.

145. Badner 1972, see especially his concluding paragraph and the list of "parallel" motifs, p. 23.
146. Gay 1971, p. 93; Luckert 1976, p. 13; Mundkur 1976, p. 437–39 and 742–44.
147. Joralemon 1976.
148. Bernal 1969, p. 101 and n. 50.
149. de la Fuente 1973, pp. 60–61.
150. Leigh 1966, pp. 256–69.
151. Cf. n. 2 (p. 268) by Paddock 1973, and his chronological chart, p. 90, and comments on the areas involved, p. 91.
152. Leigh 1966, pp. 256–69.
153. Regarding *olin nahui* and the symbolic analogies at Tenayuca see chap. 1, n. 52, 53 and figs. 23, 24. See also Díaz Bolio 1964, pp. 345–67.
154. Ramón Llige (1972, pp. 275–80).
155. Nicholson 1976, p. 168.
156. García 1607, p. 513.
157. Castañeda de Nacera 1896 (1540), p. 513.
158. Ratkay 1683; cf. Pennington 1963, p. 135 on this and other information taken from early Jesuit records.
159. García Payón 1975; Armillas 1947.
160. Hvidtfeldt 1958.
161. For more on Aztec and Mexica deities, see Nicholson 1971; Fernández 1959; Burland 1967; Palacios 1935. For a general survey relating cultural interactions and religious monuments and idols, see Jiménez Moreno 1966.
162. Chicomecoatl ("seven-serpent") is probably the conceptual archetype for Kitsis-luwa and the functional equivalent of ophidian deities (like the Maya Yum Kaax) who throughout Mesoamerican religious history presided over the fertility of maizefields. Totonacs regard the number seven as unlucky and hence assign number five to Kitsis-luwa. Cf. Ichon 1969, pp. 121–23, 126, 291, 353–64.
163. Palacios 1935, p. 263 and fig. 3.
164. Thompson 1973, pp. 58–59 and figs. 1–10. Regarding *chicchan*, cf. Thompson 1960, pp. 11, 75.
165. Kelley 1977, p. 59.
166. Burland 1967, p. 23. This stairway is illustrated by Jiménez Moreno 1966, fig. 42 and (p. 25) dated to ca. A.D. 328.
167. Thompson 1973, p. 58.
168. López de Molina 1977, pp. 3–8. The occurrence of the "reptile's eye" glyph (Caso 1961, p. 170) at Teotihuacan alongside Tlaloc or his symbols is identified with Quetzalcoatl and thought to presage the rising status of this god.
169. Kubler 1972, pp. 19, 38.
170. von Winning, 1976, pp. 150–51.
171. Coe 1965, pp. 759–61. Also see his fig. 43d; Bernal 1969, p. 96 and fig. 13.
172. See Paddock 1966, esp. figs. 21, 106, 109, 155, 186, and 187.
173. Quirarte 1976, pp. 75–85; Navarrete 1969.
174. Gay 1971, 1972, critically reviewed by D. C. Grove in *American Anthropologist* 75:1138–40.
175. At Acalpixcan, the tongue of a jaguar carved on rock is no less ophidian than the antennae of a butterfly carved close by (Beyer 1965, p. 122 and figs. 22a and 24a)—a comparison that may seem moot if one is unaware that the butterfly goddess Itzpapalotl has strong associations with the cloud-serpent Mixcoatl. In the Codices Borbonicus and Borgia, butterflies are represented with highly stylized wings in the form of U elements stacked one inside another or have the form of a flower from

whose centers antennae emerge as bifid tongues (cf. Noguera 1977, pp. 146–48 and fig. 2). At Monte Albán, the spider probably was not deified. In a spider portrayed on a gold brooch from Tomb 7, the dorsal aspect of the head and the appendages are less than accurate translations of reality inconsistent with the keen observation elsewhere apparent in Mesoamerican caricatural art (Caso 1965, fig. 57). The animal is accurately portrayed with four pairs of legs (in contrast to the three of insects); even chelicerae, the mouth appendages typical of spiders (but not of insects), are portrayed. The body outline is in the form of a vase with the anterior end opening out as a rim bending out and curving downward. According to Caso (p. 927) it represents a heart, but it is clear from Leigh's identification of a vaselike shape with Glyph C that this is precisely what the spider represents. There are even horizontal wavy lines inside it to symbolize water, and four small circles in between seem to allude to the four quarters of space. Furthermore, the spider's pedipalpi flanking its head and the chelicerae in front of its mouth are unnatural representations. The former look like U elements, flattened and slightly involute at their ends, while the chelicerae are plainly bifid rather than separate.

176. Similar bracket-shaped caudal segments and forked tongue occur on a stone lintel carved in the form of a full-bodied rattlesnake (Paddock 1966, fig. 208 and p. 182), noteworthy for the Teotihuacan calendar glyphs carved on it. In addition, it exhibits Monte Albán features, though it belongs to a regional style (Ñuiñe) that is beholden to neither metropolis. Elaborate bifid motifs and U elements (not necessarily together) occur on ceramic vessels and headdresses of figurines from Teotihuacan, often in the absence of any motifs with feline suggestiveness. Cf. Sejourné 1966, passim, but esp. figs. 6, 11, 12, 37, 72, 78, 86, 87, 95, 110, and pl. 9.

177. For general zoological information on canids (and other mammals) see Walker 1968.

178. The dog appears to have been domesticated between 11,000 and 10,000 B.C. Cf. Higgs and Jarman 1972, p. 13; Bökönyi 1973.

179. For details of canine-ophidian myths in Mesoamerica see Neumann 1975.

180. Ernst 1952, pp. 2, 59, 99–102.

181. Mbiti 1970, pp. 101–4.

182. Field 1937, pp. 73–74.

183. Hauge 1974, p. 90.

184. Griaule 1963, pp. 34–38, 45–47, 230 and fig. 32. For an illustration of the Hyena Temple at Mali, cf. *Dictionnaire des Civilisations Africaines*, p. 99.

185. Tindale 1959, pp. 310–24 and pl. 39.

186. Montagu 1974, p. 85.

187. Davidson 1936, p. 67; also pp. 88, 89 for observations on the sacredness of this art.

188. Sebeok and Ingemann 1956, pp. 152, 233; Pettersson 1957, p. 88.

189. Prokofyeva 1963, p. 156 (n. 16).

190. Ridley 1976, p. 327; also see Gimbutas 1974*b*.

191. Heimpel 1968, No. 46.1 (p. 356). Also see pp. 345–67.

192. Cook 1964–65, vol. 1, pp. 63–99.

193. Gopinatha Rao 1914, vol. 2, p. 525.

194. This is true today and must have been so in antiquity, for how else can one explain the neglect of obvious generic differences by a people as gifted as the Egyptians in observing the details of animal form and translating them into art?

195. Posener 1970, pp. 16, 44, 207b; Kees 1941, pp. 26–32; Keimer 1947; Otto 1938, pp. 12–16; Morenz 1973.

196. Feliks 1971, p. 355 in *Encyclopaedia Judaica*, vol. 4.

197. Major 1978, p. 237.

198. Luquet 1939, pp. 311–17.

199. Alekseenko 1968; Hallowell 1926.

200. Breuil and Berger-Kirchner 1970, pp. 29, 40, 53–54.

201. Marshack 1970, pp. 354–55, figs. 212, 213 (and also pp. 208–17, 235–41, and fig. 121a)

202. Gjessing 1945, pp. 282–83 and fig. 95 (3).
203. Clarke 1975, pp. 151–53; Hallström 1960, pp. 7, 8, 15–17; Lithberg 1914, fig. 164.
204. Gjessing 1975.
205. Hallowell 1926; Alekseenko 1968; Kitagawa 1961.
206. Klauber 1972, chap. 16.
207. Heizer and Baumhoff 1962, pp. 86–87.
208. Seler 1960–61, vol. 3, p. 379.
209. The Ahuízotl, an infrequently depicted legendary creature, is not even semidivine in Aztec religion. A stone sculpture of it (now at the Museo Regional de las Artesanías Populares Poblanas, Puebla, Mexico) superficially looks bearlike, but in other examples, such as the well-known Aztec feathered shield (now in Vienna), it is labeled "canine" or "coyote."
210. Kauffmann Doig 1973; Kutscher 1954, pl. 77.
211. Seler 1960–61, vol. 5, p. 70.
212. Lehmann 1962, fig. 55; Reichel-Dolmatoff 1965, fig. 5.
213. Sebeok and Ingemann 1956, pp. 155, 233; Paulsen 1961; Priklonski 1953 (1890–91), p. 11.
214. Munro 1963, pp. 18, 19, 64, 108; Sternberg 1929, pp. 769–82; Kidder 1968*b*, pp. 28–29.
215. The term *ongon* is used primarily by Mongols and Buriats. Its equivalents are *tös* (Turkic), *sione* or *siwin* or *bourkhan* (Nanai), *kegn* (Gilyak), *zeva* (Ulches), *losse* (Kets), *pupikh* (Mansi), *iren* (Tuva), *usuk* (Bachkir), and *turi* or *ierekh* (Chuvash).
216. Zélénine 1952, pp. 19–21; Karjalainen 1927, pp. 26, 27. Also see Paulsen 1961 and Roux 1966 for very extensive treatments of animals that figure in Siberian tribal beliefs.
217. Ivanov 1955, esp. figs. 8, 16, 19, and 26 and table 5.
218. The Tuvans of southwestern Siberia were originally a Turkic-speaking ethnic group that merged with Samoyed- and Ket-speaking people in the Yenisei basin. Examples of robes and drums of the Goldi tribe may be seen in Ling 1934, figs. 193, 195, 204, and 213. Also see Ivanov 1954; Eliade 1964, pp. 68, 152, n. 30.
219. Anisimov 1963*b*, p. 189.
220. Prokofyeva 1963, p. 154 and figs. 28, 32.
221. Vasilevič 1968, pp. 354–55; 1980, pp. 122–37.
222. Hawthorn 1967, pp. 50, 54–55.
223. de Laguna 1972, pt. 3, pl. 179 *(right)*.
224. For more on wolf, serpent, and other animal symbols among Northwest coast peoples, see Ernst 1952, pp. 2, 59, 75–78, 99, and n. 105 (p. 105).
225. McIlwraith 1948, vol. 1, pp. 49, 74, 75, 529, 549, 555, 571. It will be recalled that snakes are absent or rare and venomous species nonexistent in most of the Northwest Coast tribal lands (Vancouver Island and mainland British Columbia).
226. Boas 1935, pp. 146–148; Boas 1897 has more on the tribal associations of *sisiutl* myths.
227. Hawthorn 1967, p. 133. (Also see pp. 54, 55, under *Tokwit* and *Winalagilis*, and figs. 14, 126, 128–30, 163, 251–53 for Kwakiutl ceremonial headdresses, batons, "powerboards," bows, feast-dishes, and aprons bearing the *sisiutl* motif.
228. Badner, 1974. Moreover, the tongues in *b* plainly differ from the highly conventionalized depictions of killer-whale fins in Northwest Coast art. Boas 1966, pp. 322–38, figs 36, 37, stresses that the Haida normally depicted the *long dorsal fin*. The tail fin of whales lacks the deep cleft and pointed tips of the tongues in this mask. Rüstow (1968, fig. 10 and pp. 181–82) describes a similar *sisiutl* mask (Kwakiutl) with a raven's instead of a human face. From its mouth, at each corner, hangs a clearly serpentine body with a long protruding tongue.
229. de Laguna 1972, pp. 695, 744–45, 833–34. The Tlingit live 700 kilometers south of the Arctic Circle.

230. Weyer 1932, pp. 235–236.
231. Burch 1971, pp. 149, 155–57.
232. Gunn 1976. The drawing, by J. Kigusiuk, is part of a catalog of Eskimo graphic art.
233. Ray 1977, pp. 20–22. Carvings of *palraiyuk* and *tirisuk* monsters are rare in Eskimo art because of the shaman's custom of burning or abandoning ceremonial objects when closing his rites. These objects embodied the spirits of game animals and ensured their abundance as well as immunity from their attacks. Charles E. Borden (See Mundkur 1976, p. 441) suggests that the *palraiyuk* is a probable survivor from early Eskimo history. I agree, and offer archaeological data in a forthcoming article.
234. Turville-Petre 1964, especially chap. 12, and pp. 249–50.
235. Ränk 1956.

Chapter 4

1. Eichinger Ferro-Luzzi 1980, esp. p. 62, discusses these tenets, following my own criticism (pp. 59–60) of Freudian claims on the basis of examples from Hindu iconography.
2. Klauber 1972, pp. 714–18.
3. Wall 1913, p. 550.
4. Klauber 1972, pp. 703–13; Bellairs 1970, vol. 2, p. 420.
5. Posener 1970, pp. 106–7.
6. Steindorff 1935, vol. 1, pl. 74 (Nos. 42–44) and pl. 71 and 72.
7. O'Flaherty 1973.
8. Mehra 1977, p. 82.
9. Marshack 1972, figs. 149, 150, 199–201. "Serpentine" motifs are plentiful as simple wavy lines, but there is little evidence of indubitable serpent forms (like those seen in my figure 82*a*) in relation to human or animal figures portraying sexuality. Some of Marshack's figures may be either eels or serpents (see his figs. 60 and 138 and pp. 173, 262. However, true serpent forms are clear in other contexts, such as cosmic notational marks.
10. Hechter-Schulz 1966.
11. Among the South African Sotho, serpents very frequently figure as dreaded creatures in contexts of dreams, medicinal remedies, rain, and pregnancy but have no significance as metaphors involving the genital organs. Their role in sexual and fertility beliefs, if any, is indirect and exercised mainly through the water in which certain mythical ones dwell and through ancestors (Murray 1980, pp. 68–76). Also see Vinnicombe 1976, pp. 229–35; Hauenstein 1960. Small doll-like as well as large wood and stone images dating from prehistoric times to A.D. 1000 are known in northern Germany, Denmark and Norway and from the rock engravings of Bohuslän. Medieval survivals of the cult "were so obscene that they could not be reproduced." Einerstam's 1956 analysis of these phallic images includes no reference to serpents, despite the importance of the latter in mythology.
12. *Tsu* and "phallic" objects are discussed by Ho 1975, p. 82, and illustrated by Karlgren 1930, pl. 2 (1–4) and pp. 1, 21–23, 36, 48. Some consider triangles in painted mortuary ceramics "death patterns," but this is disputed by Shangraw 1975. The opera *The White Snake* is discussed in a foreword in English by Tien 1957. Dragon women in T'ang literature are discussed at length by Schafer 1973, chaps. 1, 6.
13. Opler 1945, p. 259; also de Visser 1911.
14. Casal 1956, p. 117.

15. Astour 1968, pp. 26–27. The expression "sons of" is a common Semitic way of indicating abundance.
16. Folan 1970, pp. 77–82 and fig. 1a, b; Davies 1977, pp. 67–69. Ehecatl is god of wind in the pantheon of the Mexica.
17. In the Codex Borgia 14; but see Hvidtfeldt 1958, pp. 88–89.
18. Wagner and Wagner 1934, figs. 128–31 and esp. fig. 137.
19. See chap. 1 and fig. 27.
20. Hernández de Alba 1946, p. 953.
21. Paredes 1963, pp. 59, 77–79.
22. Arguedas and Stephan 1957, pp. 152–54.
23. Goldman 1963, pp. 94, 161, 181, 257.
24. McIlwraith 1948, vol. 1, p. 362.
25. Munro 1963, p. 19; also see Opler 1945 and de Visser 1911 regarding modern Japanese serpent lore.
26. The jaguar, a pronounced symbol of masculinity, sexual assault, and procreation, was to the Páez of Colombia (Reichel-Dolmatoff 1972, pp. 54, 62) rather like the were-jaguar *nahual* of Mexico. According to Kroeber 1946, p. 708, among the Chibcha of Colombia serpents loom perhaps more prominently than jaguars and are often connected with sacred lakes. The bear is the cult animal of choice for many Eurasian tribes in phallic ceremonies (see Alekseenko 1968) but, unlike the serpent, incites no ambivalent revulsion. In Nordic fertility stories, the relationship between maidens and bears (and at times even men) is generally relaxed and cordial. See Edsman 1956.
27. Lévi-Strauss 1973, p. 207.
28. LaBarre 1969, pp. 66–67, 92, 102, 104–9, 156, 186 (see my chap. 1 for additional comments and La Barre's chaps. 8 and 11 for many more; La Barre throughout emphasizes that the serpent is a phallic symbol almost to the exclusion of feminine associations).
29. For literature citations on this very extensive problem, see Mundkur 1978 and the continuing discussions in *Current Anthropology* vol. 20, pp. 167–71, esp. by Cheek, Durand-Forest, and Heyden.
30. La Barre's notes and bibliography (1962–69) omit such useful citations as Mandlik 1896, Vogel 1926, Bruyère 1930, Díaz Bolio 1964, and—oddly for an anthropologist with psychological leanings writing on the motives and structuralist aspects of cult practices—Durkheim 1915 and Lévi-Strauss 1963*b*.
31. Eichinger Ferro-Luzzi 1980, pp. 47, 59, 64. The phrase italicized in this quotation is inspired by the vagina dentata myths of some cultures.
32. Shere 1961; Morricone 1950, p. 320 and fig. 93; Zervos 1969, pl. 142.
33. Esaka Teruya is cited in Kidder 1968*a*, pp. 94, 112; also see Kidder 1968*b*, p. 50 and pl. 4a.
34. Kidder 1968*a*; 1968*b*, pp. 28–32 and pl. 1(c), 5(a).
35. Ross 1967, esp. pp. 124, 136, 345–51 and pl. 44*a*, *b*, 68*a*, *b*, and 83*b*; also Dillon and Chadwick 1967, esp. pp. 10, 206, 214–15 and passim, for general information on Celtic religion and resemblances to Hindu features.
36. Lengyel 1969, p. 39. Illustrated in another context in chap. 6 (fig. 106).
37. Such beliefs occur in many tribal cultures of Africa (Lévy-Bruhl 1971, pp. 292–300) and ancient Greece (Harrison 1922, pp. 328–31), to name but two regions.
38. Glob 1957, figs. 4, 7 and pp. 125–26.
39. Carter 1972, pp. 24–26, fig. 13. Regarding cultural interrelationships with other serpent-venerating regions in the area, see Frifelt 1971 and Burkholder 1971.
40. For Spanish baetyls and plaques, see Almagro Gorbea 1973, pp. 181, 338–40, fig. 22 (*2*)–(*10*), and fig. 34 (*9*)–(*16*); for rupestral representations, see Acosta 1968, pp. 74, 75, 81 and figs. 8–13, 17(*10*), (*13*); Leisner and Leisner 1943, pl. 88A(*13*), 148, 149,

153–56 (these four show triangles, eyes and/or ophidian symbols). For Portuguese examples, see do Paço 1940, figs. 1, 3, 5; Bethencourt Ferreira 1940, fig. 1; Bouza-Brey Trillo 1940.

41. Bagolini 1973, pp. 59–78, and figs. 3, 5.
42. Graziosi 1968, pp. 9–36, pl. 10, 28, 29.
43. Mertseger is not characterizable as primarily a fertility goddess. However, as Bruyère 1930, p. 36–37, indicates, she is "thébaine de naissance, mais de filiation libyenne."
44. According to Landsberger, cited by Heimpel 1968, p. 494.
45. Heimpel 1968, No. 87.1. Another, No. 87.7, concerns the ophidian deity Kadi of Der. Nintu, Ninmaḫ, and Ninhursag are synonyms (see Ringgren 1973, p. 8).
46. Heimpel 1968, Nos. 81.11 and 87.2.
47. Parrot 1960, figs. 368, 284.
48. Ringgren 1973, p. 20.
49. Woolley 1955, pp. 12, 13 (and n. 3). It is noteworthy that painted pottery vessels of the al-Ubaid period have not only naturalistic serpents, but also pubic triangle and chevron motifs (pl. 18, U. 1552, U. 15372, and U. 15384). Large jars with prominent painted triangles, used to bury children in, are known from the very early Hassunah period; some have lids with double series of chevrons (see Goff 1963, fig. 57 and p. 8).
50. Andrae 1922, pp. 36–38, fig. 5. Also see Parrot 1956 for a definitive report on the Temple of Ishtar.
51. For example, in the Ugaritic Minet el-Beida goddess (see Pritchard 1955, fig. 464).
52. Schaeffer 1932, pl. 9 (l, d); Grant 1929, fig. 3(a).
53. Ben-Dor 1950, p. 26 and pl. 12 (5); Aharoni 1974.
54. Finds are reported at Tell Mevorakh, Megiddo, Gezer, Hazor, Sechem, and Timna (see Stern 1977, p. 90; Rothenberg 1972, pp. 151, 173, 184). The Israelite ophidian fertility cult is discussed by Joines 1968.
55. Rowe 1940, pl. 42A, 2, 5; pl. 44A, 4. Modern Beisan in Israel is built upon the ancient city of Beth-Shan ("House of Shan"), which was possibly "associated in some way with the old Mesopotamian serpent-deity Shahan, Sakhan or Shakhan."
56. Ringgren 1973, pp. 10–11. For more details about this clay shrine (Yale Babylonian collection No. 2240), see Van Buren 1930, p. 248. For an alternate meaning of Dumuzi's epithet, see chap. 2, n. 77.
57. Dothan 1971, p. 129, fig. 91(1), pl. 82.
58. Van Buren 1950, pp. 141–42.
59. Mallowan 1947, p. 207; Goff 1963, p. 150; some of these "hats" are flat and may, indeed, be the goddess's crown. Also see Crawford 1957 for maps (pp. 21 and 30) envisioning diffusion of the "eye-goddess's cult."
60. Woolley 1955, pl. 22 (U. 15398); Goff 1963, fig. 675.
61. Garstang 1934, pp. 125–26.
62. Epstein 1966, p. 77 and n. 3. A useful account of Near Eastern abstract motifs is given by Goff 1963, chap. 4.
63. Ringgren 1973, pp. 25, 81.
64. A similar terracotta house is also known from Palestine (Rockefeller Museum, Jerusalem, Acct. No. P1804), but its windows are not triangular. It is thought by some to be an "incense burner." However, a figurine of a woman is seated in one of its windows, her thighs spread apart to exhibit her genitals to a man who leers at her. There is a large serpent in attendance, and remnants of the forefeet of a goat and the head of a lioness in relief—Astarte's other emblems—enhance the homology with Kilili's house.
65. Caubet 1971, pp. 7–12.
66. Renfrew 1972; Brice 1972.
67. Dikaios 1940, p. 173. Also see Spiteris 1970, pp. 14–18, 30, 31.

68. Dikaios 1940, esp. figs. 10, 17, and pl. 1, 2, 7, 27(a), 28(b), 30(b). For a clear association of chevrons and a naturalistic serpent effigy appliquée on a jug (also sun motifs and swastikas), see Stewart and Stewart 1950, pl. 53(a), 48(b), 55, and 79.
69. Karagheorghis 1972, p. 111, figs. 1–8. The pyxis mentioned bears Cyprus Museum Acc. No. VT/291.
70. Dikaios 1940, pl. 28(b).
71. Christopoulos 1974.
72. Kalicz 1970, pp. 18, 30–32; also see Korosec 1966 and Pavúk 1964, pp. 16–56, for a general account of these affinities.
73. Parrot 1969, p. 49 translation and pl. 3 (4).
74. Hittite contacts with the kingdom of Ahhiyawa (located by some in or near the island of Rhodos off southwestern Anatolia and in Troy in western Anatolia) are much debated. The consensus seems to be that there are no evidences of contact with the Mycenaean Achaean Greeks until about 1400 B.C.—about 800 years after the manufacture of these idols. A succinct account of these problems, discussed at an international colloquium at the University of Sheffield, is given by Crossland in *Country Life,* October 2, 1980, pp. 85–86.
75. Akurgal 1962, pp. 30–32.
76. Akurgal 1962, pp. 76–80. For other disc idols, see Özgüc 1957, esp. figs. 2, 3, 4, and 21.
77. Akurgal 1962, pp. 14, 81–82 and fig. 164 (bottom). Illujanka, however, is interpreted as a male dragon and hence not the personage represented in figure 92*b*.
78. Branigan 1969, pp. 28–38; Willets 1962. Neutsch 1974, pp. 686, 692, discusses the view that the "Palace of Minos" at Knossos, in Crete, was never a residence but served as a commercialized mortuary center devoted to obsequies. He believes that the low-relief motif of wide, sinuous bands occurring on its clay vessels *(pithoi)* is, in fact, a serpent symbol.
79. Kenna 1960, p. 20, n. 8, and fig. 30.
80. Zervos 1956, pl. 222.
81. Vaughn 1959, pp. 125–26; Myres 1950, pp. 1–6. Also see Simon 1972, p. 209, fig. 6, for decorations on the skirt in an image of Hera, goddess of maternity and conjugal love.
82. Zervos 1956, pl. 63.
83. Evans 1921, vol. 1, p. 42.
84. Ervin 1969, p. 346 and pl. 88; also see Taylour 1970.
85. Mylonas 1966, pp. 114–15 and fig. 107.
86. Matz 1951, pl. 49(3). Also see pl. 55(4).
87. Hogarth and Welch 1901, p. 96.
88. Zervos 1957.
89. Seidentopf 1973, vol. 6, pl. 63 (2.B4); vol. 5, pl. 5(3), 9(2), 17(4), and 29(1); Müller and Oelmann 1912, pl. 20(1).
90. Biesantz 1953, p. 53; Vanderpool 1959, 282 and pl. 74 (fig. 3). Cook (1964–65, vol. 2, p. 1155), though unaware of this stele, mentions that the cult of Zeus Meilikhios seems to have been practiced in Thessalia since prehistoric times as evidenced by ophidian images found there. The nearest stonework "parallels" to this stele are the statue-menhirs of Mas Capelier and Serre-Grande in southern France, but the "resemblances" are slight and certainly not enhanced by any independent data bearing on genetic homology.
91. Kalicz 1970, pp. 31, 40, and pl. 11, 12, 13, 16, 32–34.
92. Sümeghy 1970, pp. 230–31; but see Tulok 1971, pp. 1, 2, 10, for a different view.
93. Kalicz 1970, pp. 42–43 and pl. 35–39.
94. Garašanin 1968 (see summary in French).
95. Pavúk 1964, esp. figs 5, 6, and pp. 11–16.
96. Dumitrescu 1961, pl. 26, 59–71 and esp. pl. 157(b).

97. Gimbutas 1974, pp. 112–45.
98. Marinescu-Bîlcu 1974. See also Passek 1935, 1961; Ribakov 1965.
99. Niţu 1972, figs. 2(5) and 13.
100. Cook 1964–65, vol. 1, pp. 394–97.
101. Falkenstein 1967, pp. 47–48. Langdon 1914, p. 126 categorically assigns ophidian qualities to Nintu (=Ninmaḫ).
102. Kalicz 1970, p. 40.

Chapter 5

1. The ethologist's nuances of taxes, reflexes, etc., are implicit in the word "instinct." Stimuli trigger instinctive behavior but do not necessarily guide an animal through an *entire* pattern of reactions, for these may to some extent be modified by external influences. "Ophidiophobia," as always in this book, is used in a general, not clinical, sense except in some of the extreme cases described later in this chapter.
2. Leshner 1978, John 1977 (esp. chap. 5), Kandel 1976, Gazzaniga and Blakemore 1975, Grossman 1973, and McGough 1971 give abundant technical details.
3. Montagu 1976, pp. 3–4.
4. H. F. McGee, in Mundkur 1976, p. 445.
5. Rachman 1974 and Gray 1971, given comprehensive technical reviews. For more detailed research reports, see Eysenck 1973.
6. Schroeder and Rich 1976, pp. 171–86.
7. Wooton 1976, pp. 171–86.
8. Jacobs and Popper 1968, pp. 109–10. Also see Segal, Hershkowitz, Samuel, and Bitterman 1971, pp. 249, 250.
9. Chu and McCain 1969, pp. 14, 15.
10. Goldby and Gamble 1957, pp. 384–417.
11. Mrosovsky 1970, p. 648. Sun-compass orientation in land tortoises is discussed by Gourley 1974.
12. See Hinde 1970 for a comprehensive general treatment of species-specific animal behavior, viewed in comparative physiological and ethological terms, especially visuo-motor effects (pp. 467–71) and qualitative and quantitative differences between species at different evolutionary levels. For specialized reviews of oculomotor systems and brain functions, see Ziklund 1973; Horn 1965 discusses the psychology and physiology of selective visual and sensory perception. Walk 1965 discusses visual depth and distance perception in relation to behavioral effects. Also see Stenhouse 1973 and Scott 1972, pp. 97–146. Differences of behaviors in mazes are described by Warren 1965.
13. Gray 1971, pp. 35–53.
14. For details see Leshner 1978, Gazzaniga and Blakemore 1975, and Ziklund 1973.
15. Schacter, p. 530 in Gazzaniga and Blakemore 1975.
16. Schacter, pp. 553, 557 in Gazzaniga and Blakemore 1975; Gray 1971, pp. 61–65.
17. Leshner 1978, pp. 288–308.
18. The wider implications of the potential uses of *ayahuasca* and other psychotomimetic drugs are discussed later on in this chapter. Regarding the chemistry and psychological effects of hallucinogens in general, see Hoffer and Osmond 1967.
19. Weckowicz 1967, p. 577.
20. Mitchell and Gosden 1978 reveal striking homologies (especially between man and chimpanzee) by cytological techniques, chromosome banding, cell hybridization (gene mapping), and DNA-DNA reassociation studies of (chromosomal) sequential parallels. "In situ hybridization of transcribed and non-transcribed repeated DNA sequences demonstrates that many presumptive chromosome homologies share the same sequences although . . . the amplification of particular sequences vary between

[man, chimpanzee, gorilla, and orangutan]." Blood-group affinities in anthropoid apes and man are discussed by Socha and Moor-Jankowski 1979.

21. Fantz 1965, pp. 371–99, reviews visual discrimination in primates; Gray 1971, pp. 42–52, describes several important experiments on the genetics of fear.
22. Harlow and Harlow 1965; Mason and Sponholz 1963.
23. Joslin, Fletcher, and Emlen 1964, pp. 348–52.
24. Wolin, Ordy, and Dillman 1963 report that rhesus monkeys including both laboratory- and jungle-reared individuals from Asia, showed no positive indications of ophidiophobia under their experimental conditions when tested with a North American garter snake.
25. Dittus 1975, p. 139.
26. Jolly 1966, p. 85; Harrington 1975, pp. 274–75. Defecation and urination are common occurrences among chimpanzees and gorilla in experiments involving serpents.
27. Doyle 1974, p. 337.
28. Medin and Davis 1974, p. 22, Bessemer and Stollnitz 1971, p. 51, and Wilson 1974 review memory, visual stimuli, and learning in monkeys.
29. Rumbaugh 1968, pp. 294–96.
30. Struhsaker 1967, pp. 305–7.
31. Jay 1965, p. 547.
32. Bertrand 1969, pp. 142–43.
33. Jolly 1972, pp. 70–71.
34. Altmann and Altmann 1970, pp. 184–85, review the literature on various predators of the baboon. Only an estimated 4 percent of leopard kills include baboons. Occasional kills by lions, spotted hyenas, and dogs have been reported. The field observations of Kummer 1968, pp. 164–65, in Ethiopia yielded no evidence of contacts or kills of baboons by any potentially predatory mammals. Attacks on baboons by pythons have been reported by one observer, but others believe this to be too rare an occurrence to merit serious note.
35. Bolwig 1966, pp. 276, 277.
36. A "reinforcing event" is defined in experimental psychology (in contexts of stress) as a *punishment* or *threat of punishment* that stimulates symptoms of fear which members of the test species concerned will work to terminate, escape from, or avoid.
37. The quotation at the head of this paragraph, from Noback and Moskowitz 1963 (p. 133), should be considered in the light of Geschwind's (1965, p. 273) view that "the situation in man is not simply a slightly more complex version of the situation present in the higher primates but depends on the introduction of a new anatomical structure, the human inferior parietal lobule, which includes the angular and supramarginal gyri, to a rough approximation areas 39 and 40 of Brodmann." Because it relates to speech and language—always considered uniquely human adjuncts to visually stimulated behavior—Geschwind's statement may influence anthropologists more than is warranted. In this connection, see Lenneberg 1976, Campbell (1975), Noback (1975), and Snodderly (1974) for details of the physiology of visual systems and brain evolution in various genera of the primates.
38. Masserman and Pechtel 1956. Also see the observations of Bolwig and of Joslin and coworkers cited above.
39. Falk 1978, pp. 317–18.
40. The terrestrial boas and pythons, two of the most archaic members of the Serpentes, existed in the early Cretaceous, about 100 million years ago. The most archaic venomous species of the colubrid group, too, antedate the primates by many million years. See Carroll 1969 and Stahl 1974 on reptilian phylogeny; Delson and Andrews 1975 and Tuttle 1975 review hominoid interrelationships and Welker 1976 the behavior of mammals as a function of brain evolution.
41. Hoyt 1941, pp. 187–88.
42. Riopelle and Rogers 1965, pp. 450, 460–61.

43. Yerkes 1943, pp. 34, 120–21.
44. McCulloch and Haslerud 1939, pp. 439–44.
45. Schiller 1952, pp. 180–82, 187–90.
46. Menzel, Davenport, and Rogers 1972, pp. 161, 162, 168, 169.
47. Rumbaugh 1971, pp. 24, 41–43.
48. Viki, a 5-year old chimpanzee tested against 4½- to 5½-year-old human children, performed within a 5 percent margin of error and occasionally even surpassed the children in responses to concept-discrimination problems. The latter involved identical materials and testing procedures, ranging from discriminating between colors, sizes, shapes, and animate versus inanimate objects (Hayes and Nissen 1971, pp. 83–86).
49. Wood, Moriarty, Gardner, and Gardner 1980; Redshaw 1978.
50. Jones and Jones 1928, pp. 136–43.
51. Rachman 1974, pp. 13, 14, 44, 81; Zlotowicz 1974, pp. 22–25, 28, 70–83; Shepherd, Oppenheim, and Mitchell 1971; Maurer 1965; LaPouse and Monk 1959; Zill 1977.
52. Maurer 1965, pp. 270–71, 273, 275.
53. Kornhaber and Schroeder 1975, pp. 602–5.
54. Griffiths 1970, pp. 73, 85, 145, 147, 208–9, 290.
55. Koppitz 1968, pp. 64, 131, 154.
56. Ribeyrol and Gasc 1971, pp. 382–84.
57. Du Bois 1944, pp. 170, 365, 417, 567–69. In contrast to Maurer's findings that American girls single out the serpent as the "most unpopular animal" more often than boys, Alorese boys tend to draw or impugn the serpent more often than girls. The Alorese derogatory term for witch is *palua berka*, a reference to a small, harmless green serpent. On fear and sex correlations see Speltz and Bernstein 1976.
58. Klorman, Weerts, Hastings, Melamed, and Lang 1974.
59. Geer 1965.
60. Wilkins 1978.
61. Paivio, Yuille, and Madigan 1968, esp. appendix pp. 10–25.
62. Mellstrom, Cicala, and Zuckerman 1976, pp. 83–91.
63. Lick and Unger 1975, pp. 864–68.
64. Rosen, Glasgow, and Barrera 1976, p. 209.
65. Hafner 1978, pp. 247–48.
66. D'Andrade 1973, pp. 199–204; Gregor 1981, pp. 384–87 and table 5.
67. Holmberg 1950, p. 91.
68. Kimmins 1973, pp. 93–97.
69. Hall and Van de Castle 1966, appendix A. The highest incidences reported involve "street" and "city" (149 and 128, respectively). Incidences of animals and sexual objects of interest to Freudians were as follows (parentheses show number of men/women reporting):

		(Men/Women)
Dog	19	(9/10)
Animals (unspecified)	18	(10/8)
Serpent (incl. python, rattlesnake)	13	(8/5)
Cat, kitten	12	(2/10)
Horse	9	(4/5)
Birds	5	(4/1)
Bear	4	(3/1)
Deer	3	(3/0)
Duck	3	(2/1)
Elephant	2	(2/0)
Hawk	2	(0/2)
Insects	2	(2/0)
Tiger	2	(1/1)

Wolf	2	(2/0)
Penis	2	(2/0)
Vagina	4	(4/0)
Breasts	5	(4/1)
Semen	1	(1/0)

The following animals were reported only once each: ape, boar, calf, cockroach, dinosaur, giraffe, guinea pig, lion, octopus, seal, sheep, shrimp. The incidence of food was 7. Also see Van de Castle in Kramer 1969, p. 190, regarding children's and primitive people's dreams.

70. Eggan 1966, pp. 237, 242–63.
71. Lee 1958, pp. 277, 282.
72. Cason 1935, pp. 23, 37. Cf. No. 4, 8, 16, and n. 10.
73. This recalls the circumlocutions for "serpent": "rope full of teeth," "the rope that bites," of the Hindus and *kálos*, "rope," of the Greeks.
74. Dobkin de Rios 1973, pp. 78, 79; Harner 1973, pp. 15, 160; Siskind 1973, pp. 28, 32.
75. Kensinger 1973, pp. 9, 12.
76. Regarding psychophysiological factors in schizophrenia, including disruptions of behavior, the role of the parietal lobe in visual attention, limbico-neocortical connections, motor dysfunctions, and endocrine and information-processing abnormalities, see *Journal of Psychiatric Research* 14 (1978):1–331. Also see Kramer, pp. 439–50, in Ziklund 1973.
77. Cowden, Reynolds, and Ford 1961.
78. Cowden and coworkers' observations on the lack of "normal" ophidiophobia among highly anxious schizophrenics are of interest because, like ophidiophobia, their disease has a genetic basis that is susceptible to environmental influence. Schizophrenia seems to depend on a polygenic system of inheritance, but no simple Mendelian paradigm is discernible (see Stone's 1978 extensive review, pp. 110–11; also Shields 1973, pp. 585–86, and Payne 1973, pp. 466–68). Regarding similarities of "thinking" in schizophrenia and in "normal" dreams, see Berger 1963, pp. 736–38.
79. May 1977; confirmed by essentially similar experiments of Marzillier, Carroll, and Newland 1979.
80. Washburn and Hamburg 1965, pp. 2–5, 619–20.
81. Hebb 1972, pp. 203, 205, 215, 278, 281. Among the objects mentioned as inducers of emotional displays in the chimpanzee, even normally a temperamental animal, are such things as a worm in an apple and a plaster model of a chimpanzee's face with movable jaw. It is, however, doubtful that the etiology of most of these reactions is comparable, except superficially, with the more deep-seated reaction to serpents. In this respect the chimpanzee is no different from other primates that react equally strongly to the serpent but are emotionally undisturbed by objects that affect the chimpanzee.
82. Menzel, Davenport, and Rogers 1972.
83. Stephenson 1979, p. 582. Regarding the evolution of "prosematic" communicative behavior as determined by brain structure, see MacLean 1978, p. 4.
84. Savage and Rumbaugh 1977.
85. Jerison 1979, pp. 615–35.
86. For more details on social communication in monkeys and apes, see Bolwig 1978, pp. 81, 82, Seyfarth, Cheney, and Marler 1980, pp. 801–3, and Marler 1965, pp. 555–69.
87. Sjöberg, Svensson, and Persson 1979, table 2 and p. 16.
88. Elkin 1964, pp. 161–63, Róheim 1952.
89. Mooney and Olbrechts 1932, pp. 176, 177.
90. Seligman 1910, p. 282.

91. Boas 1932, pp. 217–18 (paragraph 396). Also see paragraphs 11, 402, 704, 706a.
92. Munro 1963, p. 108.
93. Kitagawa 1961.
94. Hallowell 1926, p. 151.
95. Hallowell 1966.
96. Oppenheim 1956, pp. 221–23, 232–35. He lists (p. 352) at least five dreams of serpents and only one involving sex.
97. Quoted from E. J. and L. Edelstein by Oppenheim 1956, pp. 194–95.
98. Recorded during the reign of King Hsüan (827–782 B.C.); from the *Shih King* Ode 5, Stanzas 6 and 7 of Decade 4 (p. 350 of translation).
99. von Grunebaum and Caillois 1966, chaps. 21–25.
100. Imam Nawawi (1975, 1233), pp. 163–64 (para. 844, 845).
101. Villagers in Upper Egypt have been reported to venerate a serpent which is believed to possess the power of performing miracles. In other instances, mosques containing the graves of saints have an honored "resident snake" to which "sacred" bloody sacrifices of sheep and goats are made while beseeching cures for diseases. Ibn Batuta's descriptions of Sufi practices near Wāsit, in Iraq, include scenes of Aḥmadī devotees who grapple with large serpents and, in religious ecstasy, bite clean through into their heads. Rifā'ī dervishes are still noted for their serpent-charming rituals, and for occasionally "swallowing" the reptiles. The Hamitic 'Abada, of the Red Sea littoral, retain pronounced vestiges of a serpent cult. The Islamicized sections of East and West African native populations have fused strong elements of their original serpent myths, such as those of creation, with Arabian precepts, despite their fundamental incompatibility. The Tuareg practice divination, called *tachchelt* ("the viper"), involving interrogation of reptiles according to a set formula and interpretations of their appearances in dreams. The Hispano-Arab geographer al-Bakrī recorded, in the eleventh century, a Saharan tribe that "worshipped a certain snake, a monstrous, dragon-like reptile which dwells in a cave." In some parts of the Muslim world, ritual corteges may include representations of houses, sometimes accompanied by figures of serpents. In the Moroccan feast of 'Ashūrā, a wooden model portraying an enormous serpent with the head of a bearded man, termed *sat*, is ancillary to a model of a house, or saint's tomb with a cupola, termed *bsat*.
102. For details and references see Mundkur 1980b.
103. al-Damīrī 1906 (1344–1405), pp. 356, 366, 642, 655–56.
104. Richter 1957, pp. 193–97.
105. Cannon 1942. Less spectacular than Cannon's findings, but better comparable with ophidiophobia as a socioculturally abetted emotion, is the condition called *susto*, or "soul loss" illness. Geographically widespread in Hispanic America, *susto* is a well documented folk malady that transcends cultural, national, and ethnic boundaries. Labeled an "anxiety-hysteria" syndrome, the symptoms include depression, loss of appetite, disturbed sleep, fatigue, and asociality. The underlying causes are fright or some emotionally unsettling experience and, possibly, hypoglycemia. *Susto* is usually treated by curanderos as an emotional problem devoid of supernatural implications (see O'Nell and Rubel 1980, pp. 112–13; Bolton 1981). There is medical documentation (from the U.S.A.) of displays of apparent ophidiophobia due to quite indirect or tenuous causes: Marie, a seven-year-old girl, was hospitalized after a history of "nervousness," including mounting night terrors. As part of a psychiatric study, she was asked to make a pencil sketch for a K-F-D (Kinetic Family Drawing) Test. Labeled "me" in the drawing, she represented herself as being frightened by the sinuous reptile she had drawn adjacent to her self-portrait in a complex scene. This drawing, the physicians report, reflected "what seemed to be a preoccupation with snakes as a symbol. . . . [however,] all of Marie's symptoms disappeared

following successful treatment for pinworms. If one did not take into consideration the total physical situation and laboratory diagnosis which exposed her to the possibility of a parasitic infection, an incorrect, delimited, fragmented [Jungian, Freudian, or other] psychological interpretation would have been made." See Burns and Kaufman 1972, p. 144 and K-F-D No. 62.

106. Buss, Murray, and Buss 1968, especially table 1 and figs. 5, 6.

Chapter 6

1. Kakar, for example, offers the unhelpful explanation that "there is a general consensus among psychoanalysts that a symbol is a symbol only when it works as a symbol" (in Eichinger Ferro-Luzzi 1980, p. 57). For critiques of some current hypotheses, see Jarvie 1976, Sperber 1975b, Pyle 1973, Hubbard 1973, and Strensky 1973.
2. I rely here on van Baal's 1971, pp. 11–12, summary of de Brosses's writings.
3. Tylor 1913 (1873), pp. 229–46. For reviews of other theories see Evans-Pritchard 1965, pp. 48–77.
4. Durkheim 1915, pp. 118, 224, 234.
5. de Laguna 1972, pp. 744, 807–8.
6. See chap. 3, n. 175.
7. Douglas 1966, pp. 168–173; 1975, pp. 27–46.
8. Mills 1937, p. 223.
9. Venning 1909, p. 255; Hopwood 1917, p. 149.
10. Ben-Amos 1976, pp. 250, 251, n. 6, 252, n. 22.
11. She informs me, in a personal communication, that the Lele "have a custom of turning snakes away by singing nine songs to them when they meet them in the path, and they believe that snakes are spirits, potentially able to help humans."
12. Noguera 1977, pp. 144–47; Beyer 1965, fig. 24a.
13. Kampen 1978; Walker 1968, pp. 324–26; Ditmars and Greenhall 1935, p. 68.
14. McKnight 1975, pp. 88–95.
15. Sperber 1975a; Tambiah 1969, p. 452; Bulmer 1967, p. 21; and Lévi-Strauss 1963a, b.
16. Willis 1974, pp. 112, 124.
17. Hauenstein 1960, pp. 222–23. Python and other serpent cults are also discussed by Hambly 1931, Vinnicombe 1976, Cory 1946, and Leonard 1906, pp. 327–35.
18. Leonard 1906, p. 301.
19. de Wit 1951, pp. 292, 295, 312. Also see Posener 1970, p. 50, regarding historicity of lion and cat veneration. The historical facts that the vulture goddess Mut was eventually assimilated into the serpent goddess Edjo (see n. 50, chap. 3), and that Zeus Sabazios was transformed from his original ram form into that of a serpent (Cook 1964/65, p. 396), further illustrate caprice and the appeal of the serpent in Egyptian and Greek religious symbolism, respectively.
20. Lienhardt 1961, pp. 30, 108–11.
21. I have been unable to obtain information from Dinkaland, but the following figures of *reported* human deaths caused by various animals during a five-year period (1966–70) indicate the relatively serious toll taken by crocodiles. The data are from Rhodesia, whose fauna is not much different from that of southern Sudan: Crocodiles thirty-seven, serpents twenty-one, bees twelve, cattle eleven, buffalo six, elephants five, lions four, hippopotami four, all others (less than four each) seventeen (Castle 1971, table 2; the deaths are attributed to direct attacks and trauma; cases of deaths due to secondary causes like rabies and psittacosis are excluded).
22. Eysenck 1978, Eysenck and Wilson 1973, Ellenberger 1970.
23. Evans-Pritchard 1965, p. 41 and passim.
24. Jones 1938 presents the Freudian view of serpent symbolism and the motives for

serpent worship at great length. See esp. pp. 143, 165, 170, 174. Freudians, and Freud himself, acknowledge that several other objects envisioned by the subconscious mind may symbolize the phallus, as well as other things, but they endow the serpent with exclusively, or almost exclusively, phallic associations. I have discussed the fallacy of this in chapter 4.

25. Talbot 1927, p. 9.
26. Róheim 1972, pp. 25–29, 129–42. The medicine man's commonest assistant-totem (next to serpents) is the most un-serpent-like lace lizard, *Varanus*, (cf. Elkin, 1964, pp. 162–63 and n. 7). However, certain species common in Australia, e.g., *Sphenomorphus crassicaudus* and Burton's snake-lizard, *Lialis burtonis* (illustrated by Heatwole 1976, pl. 3 [1], 5 [1], and 6 [4]), are extremely well qualified to incite attention because they are virtually ophidian in body form and skin characteristics but differ in external morphology from true serpents chiefly in possessing either four conspicuous, diminutively short legs or rudimentary rear scalelike flaps only. Whether or not these have any significance in aboriginal totemism (or, for that matter, in psychoanalytic speculation) I do not know. Unlike serpents, lizards vary tremendously in body form and include the most unophidian quadrupeds of impressive size, such as the iguanas and monitors found widely in the Old and New World tropics. In myths, and as divinities, lizards in general are unimportant or ignored among the serpent-venerating peoples of Mesoamerica, Africa, and Hinduized Asia. However, see chap. 2 and fig. 16*c*, *d*, regarding Itzam Na.
27. Adler 1969, pp. 100–104.
28. Adler 1969, pp. 98, 99, 105, 113.
29. Ransohoff 1975, pp. 3–15.
30. Sperling 1971, pp. 494–97.
31. An archetypal symbol, in Jungian terminology, is distinguishable from personal symbols (abbreviated graphic or oral expressions pertaining to known things, for example, a clan's animal insignia) but always belongs to the collective unconscious in the sense that it transcends the experience of the individual. The collective unconscious, in Jung's words, is "the all-controlling deposit of ancestral experience from untold millions of years, the echo of prehistoric events to which each century adds an infinitesimally small amount of variation and differentiation."
32. Jung 1968, vol. 9, pp. 247–48.
33. Redfearn 1973, p. 131.
34. In Jung's foreword (pp. xiii–xiv), Neumann's book is extolled thus: "It begins where I, too, if I were granted a new lease of life, would start to gather up the *disjecta membra* of my own writings . . . and knead them into a whole. . . . Neumann uses a symbol whose significance first dawned on me in my recent writings on the psychology of alchemy: the *uroboros*. Upon this foundation he has succeeded in constructing a unique history of the evolution of consciousness, and at the same time in representing the body of myths as the phenomenology of this same evolution. In this way he arrives at conclusions and insights which are among the most important ever to be reached in this field."
35. Neumann 1970, pp. xv, 5–38, 49. Also see pp. 286–92.
36. Neumann's assertions (pp. 10–11, 37) that the ouroboros "is traceable in all epochs and cultures" and the examples used in championing its great importance warrant scrutiny. All but one of his ten illustrations from art belong to the post-Christian era; a circle only, but not the serpent, occurs even in the exception (fig. 3). His quotations from a few ancient religious texts disclose little or nothing clearly consistent with the description "tail-eater" or "tail-biter." The ouroboros is hardly important in Mesoamerican art. Neumann (p. 11 and fig. 7) cites but a single, unconvincing example of an eighteenth-century Swiss diagram of a "Mexican calendar stone with encircling serpent," though the latter is conspicuously non-ouroboric. It is notewor-

thy that the ouroboros is unrepresented in even the most important calendrical monument of the Aztecs, now at the Museo Nacional de Antropología e Historia in Mexico City. Though circular, its peripheral motif consists of a pair of semicircular serpents, aligned head to head and tail to tail (Beyer 1965, pp. 134–265). Neumann's example (p. 10) of ouroboros in the sand paintings of the North American Navajo is contradicted in Newcomb, Fishler, and Wheelwright's 1956, fig. 24 (see esp. p. 20), and figs. 52, 53, and 56. In India, only the Jaina *sūtras* (and probably only of a late period) compare the six segments of an Eon of Time with the spokes of a wheel, naming the ascending and descending periods by a term containing the suffix *sarpiṇni*, "ophidian." As far as I know, Hindu literature contains no important references to the ouroboric form as a conceptual symbol, nor is this form common in Hindu art. Neumann (p. 49) calls Tiamat, the mythical creature of Primal Chaos, a "ring snake" but cites no evidence of this, either literary or artistic (see Speiser 1965, Jacobsen 1968, Grafman 1972, Yadin 1971, and Yeivin 1971). I know only the three objects shown in figure 61, in which Tiamat is clearly serpent-bodied but neither coiled nor ouroboric. The ouroboros is not specified nor implied in the Egyptian cosmological texts cited by Neumann. Ironically, he overlooks Egyptian art, which does occasionally use the symbol among the many forms attributed to the serpent (see Clark 1959, passim, esp. pp. 239–45 and figs. 11 and 38, and references to Sito).

37. The quotations are taken from passages of Jung's original writings discussed by Monroe 1955, p. 552.
38. Willis 1974, pp. 80–81.
39. Douglas 1975, pp. 94–96, 101–2, 155.
40. Leach 1974, esp. pp. 14, 57–61, 72.
41. Freud 1915, p. 256, is explicit about rhythmic phases of coition when he interprets dreams of stairs, and of flying. Also see Grinstein 1968, chap. 7.
42. Price-Williams 1974; Edgerton 1974, pp. 62–64.
43. Cooper 1975.
44. Breger, Hunter, and Lane 1971, pp. 184–89.
45. Frith 1973; Hernández-Peon 1966; Evarts 1962.
46. Emboden and Dobkin de Rios 1980.
47. Naranjo 1973, p. 183; Dobkin de Rios 1973, p. 78.
48. See especially Marler, pp. 85–96, and Savage-Rumbaugh and Bakeman, pp. 97–116, in Bourne 1977.
49. Vaughn 1964, pp. 275–82.
50. For a wide range of pertinent technical details, see Drucker-Colín and McGaugh 1977; Weitzman, Boyer, Kapen, and Hellman 1975; Snyder 1969; Bert and Coulomb 1966; Luce and Segal 1966; Adey, Kado, and Rhodes 1963.
51. Bird-mammal conceptual pairs (or artistic hybrids), and certainly bird-invertebrate ones, seem to be very few, especially in divine contexts. When, however, one of the "partners" is the serpent, the choice of the "opponent" is often fickle: In the lower Niger, the closely related Brass and Bonna tribes have two supreme animal deities with a common derivation, for these are believed to have been "related in spirit-land." One of these is Ogidiga, the python, the other Ekiba, a monkey (see Leonard 1906, pp. 23, 388). Other pairs are the serpent-goat in Islamic beliefs (Wensinck 1916, pp. 63–64); serpent-lion deities in Meroe (Žabkar 1975, p. 38); serpent-lion, serpent-cow, serpent-wild boar, and serpent-woman in Egypt (Bruyère 1930, pp. 109–11); serpent-bull, serpent-ram, and others in Greek myth (Cook 1964–65, vol. 1., pp. 394–96); and the serpent-jaguar Chan-Bahlum (with or without the bird) in Maya art (Kelley 1977, p. 57).
52. Lévi-Strauss 1963a, p. 71.
53. Jung's purpose (according to Horowitz 1970, p. 296) "was to encourage a patient to get in touch with his 'unconscious' and to narrow the gap between conscious and

unconscious mental contents. The therapist instructs the patient to allow a deliberate dimming down of conscious mental activity and to concentrate passively on the 'unconscious background to mental life.' The technique involves a kind of active passivity, a setting aside of planful or organized thought. In this state, previously hidden contents emerge, often with intense emotion, and often in the form of visual images. Then the conscious mind takes over again and cooperates in the analysis of the images. . . . [According to Adler, however,] the products of images produced by this Jungian technique carry a quality of inner conviction that differs subjectively from reactions to ordinary daydreams. In such Jungian therapy, *archetypal images* tend to emerge as a consequence of active imagination: witches, devils, tempters, sorcerers, magicians, princes, heroes, wisemen. Archetypal images refer to universal themes that emerge in similar form in many patients because persons share a racial unconscious memory. Non-Jungians agree with the prevalence of archetypes in fantasy images, but trace this symbolic similarity to the basic patterns of the human life situation rather than to a collective unconscious."

54. Foucault 1971, p. 379.
55. Orme 1974.
56. Coulborn 1959, chaps. 1 and 2 (esp. pp. 9, 12, 14, 16).
57. Coulborn 1959, pp. 134–57.
58. Klauber 1972, p. 438, gives details about the enhanced activities of reptiles affected by seasonal rains. A report in the *Manchester Guardian* (August 4, 1976) singles out snakebites as one of the causes of death among people suffering a devastating rainfall in normally semiarid northwestern Pakistan. An Agence France-Presse report from Manaus, Brazil (*Hartford Courant,* June 10, 1976), specifically mentions venomous serpents and piranha attacking cattle and people seeking the safety of high ground in the wake of floods in the Amazon Basin.
59. Boas 1935, p. 147; McIlwraith 1948, vol. 1, pp. 49, 529, and vol. 2., p. 32.
60. Vasilevič 1968, pp. 354, 355.
61. Mbiti 1970, p. 103; Schapera 1971, pp. 34–42; Schmidt 1979, pp. 207–21; Vinnicombe 1976, p 233.
62. Knappert 1971, pp. 49, 152–54, 163, 216.
63. Montagu 1974, pp. 116–88; Roberts and Roberts 1969, p. 77.
64. Tindale 1959, pp. 310, 318, 324; Mountford 1978, p. 23.
65. Karsten 1935, p. 220.
66. The myth revolves around a quarrel between two monster serpents, *tren tren* and *kaikai.* The higher the latter raised the flood waters, the higher *tren tren* raised the mountain on which humans had taken refuge. At the end of the flood the survivors begat offspring—the ancestors of the present-day Araucanians (Gusinde 1922, pp. 183–88). The Araucanians retain traces of a Siberian type of shamanism. The majority of venom-related deaths in Chile are due to spiders, not venomous serpents, which are believed to be absent (Swaroop and Grab 1954, p. 51).
67. Parsons 1939, p. 185.
68. Chang 1970, p. 204.
69. Cohen 1978, pp. 244–46; Eberhard 1968, p. 385; de Groot 1886, pp. 318–19.
70. *Pañcaviṃsa Brāhmaṇa* 25.10.4 and 25.13.2; *Ṛg Veda* 11.17.9 and 1.52.10.
71. These monsters were probably the models for other Semitic myths. Leviathan, of Jewish popular belief, is reputedly a fish or whale. However, the name derives from a root meaning "coil." Leviathan is described as "crooked" in Kaballist texts and its eyes as "piercing," "brilliant." It and its counterpart Behemoth dwelt in *tehom,* the Hebrew for "abyss," which is cognate with the proper name Tiamat and other Semitic words connoting the sea—*ti'amtum* and *tihāmatum* in Babylonian, and *tihāmat* in Arabic (see Jacobsen 1968, p. 108). In pre-Islamic Arabia, Minaean inscriptions disclose that irrigated valleys were the preferred abode of the ophidian god

Wadd, which name, I suspect, is cognate with *wādi*, or rocky watercourse, dry except in the rainy season. The name of another Minaean deity, Naḥastāb, comes from the northern Semitic *nhs* ("serpent," synonymous with "omen," good or bad, in Hebrew, Aramanian, Syriac, and Arabic) and *nahasu* ("to become fertile, rich"). For more details, see Mundkur 1980b.

72. Q'uk Kumatz figures in line 24 (p. 4), the jaguar and other animals in line 269, with no special distinction; See Edmonson 1971.
73. de Avila 1968 (1598?), pp. 97–99; Paredes 1963, pp. 59, 77–79.
74. Falkenstein 1967, p. 47. In this religio-agricultural context, note that Sumerian cuneiform writings mention a *muš-zar-ra*, or "serpent of the grain heaps" (Heimpel 1968, Nos. 95, 95.1). About the attributes of Inanna/Ishtar as rain goddess, her many coalesced identities and animal epithets, see Jacobsen 1976, pp. 135–40; Heimpel 1968, Nos. 36.2, 36.19, 36.20, 81.2, 81.9, 81.15. Langdon 1914, pp. 87, 121–22 categorically asserts that Inanna was originally connected with ophiolatry.
75. The name Renenutet (also spelt Renenwetet) is derived from the hieroglyphs *wtt*, "serpent", and *rnnt*, which signifies agricultural productivity, specifically grain. In an annual festival, she was honored as the protectress of harvests and the nurse of the god Nepri or Nephre ("grain"), who is often portrayed as a child sitting on her lap. See te Velde 1977, p. 2; Kees 1941, pp. 56–57.
76. Cook 1964–65, vol. 1., pp. 394, n. 4, 396, 397, n. 4.
77. For some examples see Amiet 1961, pl. 35 (No. 548); Homès-Fredericq 1970, pl. 2(21), 6(78), 14(195), 15(200,203), 16(214, 215), 23(317a); Mackay 1938, pl. 162 (11b), and Tunca 1979, p. 16 and pl. 6 (No. 56).
78. There is an almost similar pot at the Ashmolean Museum, Oxford (Acc. No. E.3195), though the serpent is here horizontal and combined with the head and horns of the cow deity Hathor. Elise Baumgartel (1947, p. 31) surmised, therefore, that the horizontal form (because of its blunt head and tail) represents the hands of Hathor, clutching her invisible breasts. However, this seems unlikely to me, for a true serpent shape also occurs on a limestone jar (Ashmolean Museum Acc. No. E.293) of the Protodynastic period. Figures of lions, giraffes, ostriches, and hippopotami are sometimes found scratched on Naqada ware, but these are additions made in the late Amratian and, later, in the Gerzean (see Raphael 1947, pp. 92–101, 146; also Petrie 1896, pl. 36, no. 87, and p. 41). For radiocarbon dates and the agricultural background, see Hayes 1965, pp. 92, 147.
79. Clark 1959, pp. 50–52 and passim.
80. The *sment* goose, a creature otherwise quite unimportant in Egyptian cults, appears in one variant creation myth. The quotation is from Posener 1970, p. 264. Clark's translation (1959, pp. 91, 92, 95) is slightly different but leaves intact the sense that the primeval brood had the form of serpents, from which were created all the attendant deities of the sun god. The lines are from the Coffin Texts. In another doctrine of creation, the birth of the sun was mediated by eight paired deities—the Ogdoad of *Hmnw*, i.e., Hermopolis. Each of the four goddesses of this group (Naunet, Amaunet, Hauket, Kauket) was conceived as a serpent, and her consort a male frog or toad. These eight were the only denizens of the primeval ocean (see Morenz 1973, pp. 174–76; Posener 1970, pp. 196–97).

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